

Report to Congress:

Impact of the Medicare Hospital Prospective Payment System

1987 Annual Report

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Health Care Financing Administration**

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U.S. Department of Health and Human Services
Health Care Financing Administration
September 1990
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PREFACE

It should be noted that, after the Department prepared this 1987 Annual Report, the Congress repealed the Medicare Catastrophic Coverage Act, effective January 1, 1990.

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REPORT TO CONGRESS

IMPACT OF THE
MEDICARE HOSPITAL PROSPECTIVE PAYMENT SYSTEM

1987 ANNUAL REPORT

EXECUTIVE SUMMARY

The Social Security Amendments of 1983 and the Omnibus Budget Reconciliation Act of 1986 (OBRA 86) mandated a series of six annual reports on the impact of the Medicare Prospective Payment System (PPS). The reports are required to describe and assess the impact of PPS on beneficiaries, classes of hospitals, other providers, and other payers for inpatient hospital services. Special concern was expressed about post-hospital care.

This report is the fourth in the series and has the following objectives:

- o provide an update on the status of PPS as of 1987; and
- o report on studies of PPS impact that have been completed since the third report was prepared.

The major source of data for this report is the Medicare statistical

system. Additional sources of data for the PPS evaluation are provided by Health Care Financing Administration (HCFA) supported contract and grant research activities. Finally, where appropriate, sources of data outside of HCFA are used, including other Government sources, such as the National Center for Health Statistics, and sources in the private sector, such as the American Hospital Association.

Since the objective of this report is to describe and analyze the impact of PPS during its fourth year (FY 1987), an attempt has been made to incorporate the most recent data available at the time that the analyses were conducted. For some of these analyses, at least preliminary data on FY 1987 were available. For many of the analyses, however, including many of the hospital-level analyses and most of the beneficiary-level analyses, data were not yet available for FY 1987, so FY 1986 data were used. Future reports will update these analyses, as the data permit. The analyses covered in this report yielded the following major findings:

1. Medicare benefit payments for inpatient hospital care increased by 3.7 percent in FY 1987, the smallest increase in the history of the Medicare program. This continued the trend of declining rates of increase, which extends back to FY 1981, but which has been more pronounced under PPS. Total benefit payments under Parts A and B, however, continued to increase in FY 1987 by 9 percent, about the same rate that they have increased in each of the last 3 years. Rapid increases in payments for hospital outpatient and physician services explain most of the difference between the continued high growth in total payments and the declining rates of increase in inpatient hospital payments.

2. Total days of inpatient care per 1,000 Medicare aged beneficiaries continued to decline in 1986, as discharges continued to decline and length of stay appears to have reached a plateau. The rate of use of days of acute inpatient care by Medicare aged beneficiaries was 29 percent lower in 1986 than in 1983. Concern that utilization declines would fall disproportionately on high risk age, sex, and race groups do not appear to be well-founded. The data indicate that there has been little change in relative utilization rates among these demographic groups of Medicare beneficiaries.
3. Rehospitalization and hospital-related mortality rates were studied for evidence of changes in the effectiveness of inpatient care. The decrease in inpatient utilization has tended to increase both rates, possibly because the severity of admissions has increased. A study by Systemetrics found that changes in case mix could account for essentially all of the increase in mortality between FY 1984 and FY 1986. This study controlled for disease category, stage of illness, high risk comorbidity, age, and sex. The analysis of rehospitalization rates conducted by Abt Associates showed modest increases in rehospitalization that predate PPS, but may have been reinforced by PPS. The Abt analysis, however, did not control for changes in case mix.
4. The proportion of Medicare beneficiaries using home health agency (HHA) and skilled nursing facility (SNF) services within 30 days of discharge has increased. More services are also being provided within 7 and 30 days of discharge than before PPS. These trends are consistent with the view that SNF and HHA services have increasingly substituted for

inpatient hospital care in recent years. Econometric analyses, however, suggest that PPS has primarily shifted the timing of SNF and HHA services, rather than changed the total volume of services. With the passage of the Medicare Catastrophic Coverage Act of 1988 and some other events (clarification of the definition of "skilled" level of care and a court decision regarding intermittent HHA care), it is likely that total SNF and HHA utilization will increase in the future.

5. The data suggest that post-hospital services have become more available to Medicare beneficiaries during the PPS years. The number of Medicare certified SNFs and HHAs has increased. There has been a large increase in the number of hospital-based HHAs, which may facilitate discharge planning for patients in need of post-hospital care. In addition, SNFs and HHAs appear to be offering a wider range of services. The gap between urban and rural utilization rates of post-hospital care has been shrinking, especially for SNF care.
6. Hospitals with swing-bed programs and/or long-term care units have been hypothesized to be especially susceptible to the financial incentives under PPS for early acute care discharge. HCFA funded a University of Colorado (UC) study of this issue. UC found no differential changes in length of stay or case mix between swing-bed hospitals and a comparison group of hospitals that would indicate adverse effects of swing-bed care. At least among the small rural hospitals studied, swing-bed care appeared to substitute for other SNF and home health care and contributed

to lower subsequent acute care use and cost. The study concluded that swing-bed care provides a viable additional option for Medicare post-hospital care.

7. Section 9305(i) of OBRA 86 requires that this report contain information on reconsideration and appeals regarding payment for post-hospital care. The option of reconsideration and appeal is available to beneficiaries whose claims were denied. In FY 1988, approximately 22 percent of SNF claims were denied, compared to 28.6 percent in FY 1987. In FY 1988, there were 16,587 reconsideration requests, which comprised approximately 9.8 percent of denied SNF claims and 2.1 percent of all SNF claims. Including submissions from the previous year, 18,710 requests were processed, of which 5,996 were reversed in whole or in part. There were 1,231 Administrative Law Judge cases completed, of which 742 were reversed. During FY 1988, approximately 3.6 percent of HHA claims were denied, compared to 5.7 percent in FY 1987. In FY 1988, there were 43,894 home health care cases submitted for reconsideration, which comprised approximately 17 percent of all HHA denials and 0.6 percent of all HHA claims. Including submissions from the previous year, a total of 60,756 cases were processed, of which 20,208 were reversed. Of 8,971 HHA appeals received in FY 1988, 3,296 were heard with 2,452 reversed partially or fully.
8. Significant revenue growth, combined with a sharp reduction in the rate of increase in Medicare operating costs, resulted in a first year PPS operating margin of 14 percent.

During the second PPS year, PPS operating revenue and Medicare operating costs grew at about the same rates, and, as a result, the PPS operating margin remained at about the PPS-1 level. Since then the PPS margin has declined (to 9-10 percent in PPS-3 and about 4 percent in PPS-4) as PPS revenue per case has risen more slowly (about 4 percent annually), and Medicare operating cost per case has continued to rise at annual rates of 9-10 percent.

9. Possible factors responsible for the 9-10 percent annual increases in Medicare operating cost per case since PPS-2 include changes in hospital behavior and the adoption and diffusion of expensive, increasingly complex services. The evidence is suggestive, but hardly conclusive, that the high margins of the early PPS years lessened the pressure for continuing cost reductions. As a result, hospitals may not have continued to press their medical staffs for additional cost savings and may have been more receptive to medical staff requests for new diagnostic and therapeutic capabilities. In addition, recent research at Rand (Carter, 1989) found that about two-thirds of the 2.4 percent increase in case mix between FY 1986 and FY 1987 was unrelated to coding and diagnosis related group classification effects, and hence is presumed to reflect increased patient resource requirements.
10. Medicare capital costs, which continue to be paid on a reasonable cost basis, have risen more rapidly than operating costs during the PPS period. As a result, the ratio of inpatient capital to operating costs has risen from 8.6 percent in the Tax Equity and Fiscal Responsibility Act (TEFRA) year to 11.3 percent in the PPS-3 year.

This ratio had been fairly stable in the 8 percent range for several years prior to PPS. It is not possible to determine the extent to which the rise in this ratio represents a shift in cost accounting in response to PPS or a genuine increase in the capital intensity of inpatient care.

11. As shown in previous Impact Reports, PPS operating margins vary widely among different groups of hospitals. Particularly noteworthy in the fourth PPS year is the relatively high margins of major teaching hospitals. Major teaching hospitals have consistently displayed higher PPS margins than other hospital groups. They also have proved more able to resist declines in PPS margins than other groups, even though indirect medical education payments were reduced in 1986. Their PPS operating margin declined from the 18-20 percent range in PPS-1 and PPS-2 to 13.6 percent in PPS-4.
12. Rural hospitals continue to display lower PPS operating margins in the third and fourth PPS years than do urban hospitals. Indeed, in the PPS-4 year, the PPS operating margin of rural hospitals slipped below zero (from -0.2 to -0.8 percent, depending on the exact set of hospitals examined). Between the PPS-1 and the PPS-4 years, however, PPS operating revenue per case rose at about the same rate for urban and rural hospitals. Medicare operating cost per case has risen less rapidly for rural than for urban hospitals over the same period. As a result, the difference in urban-rural PPS operating margins has narrowed slightly.

13. These findings on urban-rural PPS operating margins are consistent with the conclusion set forth in the 1987 Report to Congress, "Studies of Urban-Rural and Related Geographical Adjustments in the Medicare Prospective Payment System." The Report concluded that the changes made in the PPS payment structure since 1987 have essentially removed systematic biases against rural hospitals as a group. Only one of these changes—the establishment of separate urban-rural outlier offsets—is substantially reflected in the PPS-4 data. Subsequent changes, whose effects are expected to be reflected in future years' data, include the case weighting of payment rates, completion of the transition to national rates, and differential update factors.
14. There is considerable evidence that further changes in the PPS payment formula will not solve the problems of many rural hospitals. Large declines in inpatient utilization pose a major problem that PPS cannot address. HCFA-funded research (Hendricks, 1988) found that 54 percent of the rural hospitals studied had discharge declines in excess of 20 percent during 1983-1986. Increases in total cost per case were found to be strongly related to declines in discharges. Hospitals with discharge declines in excess of 40 percent experienced a 3-year rate of increase in cost per case of 95 percent, compared to less than 3 percent for hospitals whose discharges increased by more than 20 percent.

15. Since 1983, rural hospitals have represented an increasing share of total closures. Both urban and rural closures tend to be small hospitals and have been concentrated in Texas, California, New York, and the Midwest. Hendricks found that the majority of rural hospitals that closed between 1980 and 1985 were located in counties with other acute care hospitals. Even when the hospital that closed was the only hospital in the county, Hendricks concluded that there were few situations where needs are likely to be unserved. Over half of these counties were adjacent to metropolitan statistical areas, and inspection of road maps showed that almost all are near cities with a hospital. Under these circumstances, problems may be limited to persons with poor access to transportation and other types of personal assistance.
16. Changes in health insurance and health services markets that began in the early 1980s and gained momentum with the introduction of PPS continued in 1987. Increased use of prospective hospital payment is found among Medicaid programs and Blue Cross plans. Research suggests that, even after controlling for the independent effects of Blue Cross cost containment measures, PPS spillover effects appear to have reduced payments for Blue Cross patients under age 65.
17. Other major changes include the rapid growth of managed care systems such as health maintenance organizations and preferred provider organizations and the expansion of various forms of self-insurance. These changes are not clearly attributable to the introduction of PPS. However, PPS "legitimized" cost containment activities by other payers and certainly contributed to competition among insurers in the middle and late 1980s.

Chapter 1

INTRODUCTION

This is the fourth in a series of six annual reports by the Department of Health and Human Services (DHHS) to describe and assess the impact of the Medicare Hospital Prospective Payment System (PPS). PPS was enacted by the Congress in the Social Security Amendments of 1983 (Public Law 98-21). Section 603(a) of that legislation requires the Secretary of Health and Human Services to:

...study and report annually to the Congress at the end of each year (beginning with 1984 and ending with 1987) on the impact, of the payment methodology under Section 1886(d) of the Social Security Act during the previous year, on classes of hospitals, beneficiaries, and other payors for inpatient hospital services, and other providers, and, in particular, on the impact of computing DRG [diagnosis related group] prospective payment rates by census division, rather than exclusively on a national basis.

Each annual report is also to include recommendations for such changes in legislation as the Secretary deems appropriate.

In the Omnibus Budget Reconciliation Act of 1986 (OBRA 86, Public Law 99-509), the Congress extended the mandate for the annual reports through 1989. Section 9305(i) of OBRA 86 requires that each annual report shall include:

- (i) an evaluation of the adequacy of the procedures for assuring quality of post-hospital services furnished under title XVIII of the Social Security Act,
- (ii) an assessment of problems that have prevented groups of medicare beneficiaries (including those eligible for medical assistance under title XIX of such Act) from receiving appropriate post-hospital services covered under such title, and
- (iii) information on reconsiderations and appeals taken under title XVIII of such Act with respect to payment for post-hospital services.

This information was to be included beginning with the 1986 report.

In response to this congressional mandate, DHHS has undertaken a major effort to evaluate the new payment system. This evaluation effort has been designed and implemented with the following objectives in mind:

- o to conduct a systematic evaluation of a policy change that has had a dramatic effect on the entire health care system;
- o to describe the behavioral changes occurring among the institutions and individuals that provide, utilize, and pay for health care, particularly among Medicare providers and beneficiaries; and
- o to determine, to the extent possible, the degree to which PPS is responsible for the changes observed since its implementation.

The series of annual reports is based on this effort.

The first report in this annual series (U.S. Department of Health and Human Services, 1985) was devoted primarily to a discussion of the development and major features of PPS, an outline of the methodological approach to be taken in evaluating its impact, and a presentation of early descriptive data on the performance of the health care sector during the first year of prospective payment. The second report (U.S. Department of Health and Human Services, 1987) updated the information presented in the first report and addressed several additional issues that could not previously be addressed, due to the availability of new data and results from several studies that were in their initial or planning stages at the time that the first report was written. The third report (U.S. Department of Health and Human Services, 1989) reflected a substantial increase in the volume of available information on the impact of PPS. It reported on many studies begun early in the PPS period that shed more light on the effects of the new payment system.

This fourth report has the following objectives:

- o provide an update on the status of PPS as of 1987, and
- o report on studies of PPS impact that have been completed since the third report was prepared.

The major source of data for this report is the Medicare statistical system. The Health Care Financing Administration (HCFA) collects a rich body of data associated with the utilization and cost of inpatient hospital

services and other inhospital and ambulatory care services covered by Medicare.

Additional sources of data for the PPS evaluation are provided by HCFA supported contract and grant research activities. These activities have provided many of the analyses of the impact of PPS as well. Finally, where appropriate, sources of data outside of HCFA are used, including other Government sources, such as the National Center for Health Statistics, and sources in the private sector, such as the American Hospital Association (AHA).

Since the objective of this report is to describe and analyze the impact of PPS during its fourth year (FY 1987), an attempt has been made to incorporate the most recent data available at the time that the analyses were conducted. For some of these analyses at least preliminary data on FY 1987 were available. In the absence of FY 1987 data, FY 1986 data were used. Future reports will update many of these analyses as the data permit.

One of the major problems in evaluating PPS is that of attribution. It is difficult to draw strong causal inferences about the effects of the new system because of the rapidly changing nature of the health care sector. Many changes are occurring that might plausibly account for effects of the type anticipated under PPS. Both desirable and undesirable effects that might be consistent with expectations about PPS may actually be caused by other factors or--most likely--are the joint product of PPS and several other factors.

The remainder of this introductory chapter reviews the status of PPS payment rules in FY 1987 and updates trends in Medicare benefit payments by major service categories (inpatient hospital, hospital outpatient, physician services, and post-acute care services.) This material provides a context

for much of the discussion that follows in subsequent chapters.

The four chapters that follow are almost equally divided between the impact of PPS on Medicare beneficiaries and the impact of PPS on the health care sector. Chapter 2 deals with PPS impact on Medicare beneficiaries, and Chapter 3 focuses specifically on some recent studies of post-hospital care that deal with both beneficiary and provider issues. Chapter 4 discusses PPS impact on Medicare providers of inpatient and outpatient hospital care. Chapter 5 looks beyond Medicare to the rest of the health care sector, focusing on other payers. Information on physicians' services that in past years has been included as part of the PPS annual report has been omitted this year. These issues are being addressed in detail in the report mandated by Section 4056(c)(2) of Public Law 100-203, "Growth in the Volume and Intensity of Physician Services: Issues and Options."

PPS Payment Rules in FY 1987

Under the original PPS legislation, FY 1987 would have marked the end of the phase-in period from blended hospital-specific, regional, and national payment rates to fully national rates. As discussed in the 1986 Annual Report, however, Public Law 99-272--the Consolidated Omnibus Budget Reconciliation Act (COBRA)--delayed the transition by 1 year for all PPS hospitals except those in Oregon. Under the revised schedule, for the cost reporting period beginning in FY 1987, most hospitals' PPS rates went from a 45/55 percent blend to a 25/75 percent blend of hospital-specific and Federal rates. The national/regional blend of the Federal portion of the PPS rate changed from 25 percent national/75 percent regional in FY 1986 to 50 percent national/50 percent regional in FY 1987.

In most other respects, PPS changed very little in FY 1987. Massachusetts and New York hospitals began their second full year on PPS at various times during FY 1987. Maryland and New Jersey hospitals continued to be paid under a waiver from PPS. Other hospitals excluded from PPS (i.e., psychiatric, rehabilitation, children's, and long-term care hospitals) continued to be excluded in FY 1987. The disproportionate share payment provisions and related reduction in indirect medical education payments, enacted in COBRA and which became effective May 6, 1986, continued without change. Capital-related and direct medical education costs continued to be paid on a reasonable cost basis. Public Law 99-509 (OBRA 86), however, reduced payments for capital-related costs by 3.5 percent for portions of cost reporting periods in FY 1987. Additional details of the disproportionate share and capital payment provisions are discussed in Chapter 4.

Medicare Benefit Payments

In FY 1987, the rate of increase of total Medicare benefit payments was 9.0 percent, and the growth during the period FY 1984 through FY 1987 was the slowest for any 4 consecutive years since Medicare began. (See Table 1.1 for an overview of the estimated incurred Medicare benefit payments under both the Hospital Insurance (HI) and the Supplementary Medical Insurance (SMI) Programs.) PPS has helped to reduce the growth in Medicare benefit payments for inpatient hospital services, which account for more than 60 percent of total benefit payments. However, growth has not slowed in two types of services that comprise another 33 percent of the total Medicare benefit payments: hospital outpatient services and physician services. Tables 1.2 and 1.3 provide dollar and percentage distributions of incurred benefit

payments by type of provider from the beginning of the Medicare program through FY 1987.

Inpatient Hospital Benefit Payments

Inpatient hospital benefit payments increased 4.7 percent in FY 1986--at that time the smallest increase in the Medicare program's history. The growth in hospital benefit payments continues to slow down: for FY 1987, the increase was only 3.7 percent.

The percentage of total Medicare benefit payments accounted for by inpatient hospital services had dropped before PPS--from a peak of 70.1 percent in FY 1972 and FY 1973 to 65.2 percent in FY 1983. After 4 years of PPS, the share of inpatient hospital payments was at an all-time low of 58.7 percent in FY 1987.

Outpatient Hospital Benefit Payments

Outpatient hospital payments grew from \$25 million in FY 1967 to over \$6.1 billion in FY 1987. In previous PPS Impact Reports, we noted that outpatient hospital payments had double-digit increases in every year since the beginning of the Medicare program. Much of this increase was due to expansions in coverage for outpatient services as the Medicare program developed, such as including routine maintenance dialysis treatments in FY 1974. Under PPS, with inpatient hospital benefits growing at a decreasing rate, the share of outpatient hospital payments has continued to increase--to 7.5 percent in FY 1987. At the beginning of the Medicare program in 1967, the share of outpatient hospital payments was only 0.6 percent.

Physician Benefit Payments

Physician services continue to be second only to inpatient hospital services in volume of Medicare benefit payments. As shown in Table 1.2,

physician payment increased from \$1.0 billion in FY 1967 to \$13.8 billion in FY 1983. We reported in previous reports that the compounded annual rate of increase during the pre-PPS period was 17.2 percent. The growth in incurred Medicare benefit payments for physician care slowed during fiscal years 1984 and 1985, but a sharp increase occurred in FY 1986 (14.2 percent). In 1987, that growth continued at a rate of 16.3 percent.

Skilled Nursing Benefit Payments

Skilled nursing payments account for a smaller share of total Medicare benefit payments than any other major component. Benefit payments for skilled nursing care have followed an irregular pattern of growth--rising and falling--for 20 years. We reported that the compounded annual rate of increase during the pre-PPS period was 8 percent. However, the growth in estimated incurred benefit payments for skilled nursing care was 4.4 percent in FY 1987, compared to a -1.1 decrease in FY 1986.

Home Health Benefit Payments

Home health benefit payments grew at annual rates of 20-30 percent in the early 1980s. Since 1985, single digit rates of increase have occurred. In 1987, home health benefit payments increased 6.7 percent.

Table 1.1

ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS
UNDER HOSPITAL INSURANCE (HI) AND SUPPLEMENTARY MEDICAL INSURANCE (SMI)
FY 1967-87
(in \$ billions)

Fiscal Year	HI Payments		SMI Payments		Total Payments	
	Amount	Percent Change	Amount	Percent Change	Amount	Percent Change
1967	2.927	---	1.109	---	4.006	---
1968	3.868	33.5	1.443	30.1	5.311	32.6
1969	4.675	20.9	1.750	21.3	6.425	21.0
1970	5.018	7.3	1.929	10.2	6.947	8.1
1971	5.623	12.1	2.090	8.3	7.713	11.0
1972	6.176	9.8	2.289	9.5	8.465	9.7
1973	6.787	9.9	2.500	9.2	9.287	9.7
1974	8.304	22.4	3.149	26.0	11.453	23.3
1975	10.381	25.0	3.928	24.7	14.309	24.9
1976	12.357	19.0	4.818	22.7	17.175	20.0
TQ*	3.307	----	1.465	----	4.772	----
1977	15.175	----	6.134	----	21.309	----
1978	17.549	15.6	7.254	18.3	24.803	16.4
1979	20.132	14.7	8.613	18.7	28.745	15.9
1980	24.269	20.5	10.469	21.5	34.737	20.8
1981	29.140	20.1	12.558	20.0	41.698	20.0
1982	34.524	18.5	14.817	18.0	49.341	18.3
1983	39.408	14.1	17.662	19.2	57.070	15.7
1984	43.144	9.5	19.845	12.4	62.989	10.4
1985	46.652	8.1	21.948	10.6	68.600	8.9
1986	49.875	4.8	25.694	17.1	75.569	8.7
1987	50.776	3.9	30.469	18.6	81.265	9.0

* Transitional quarter to adjust for change in start of Federal fiscal year from July 1 to October 1 in 1976.

Source: Health Care Financing Administration, Office of the Actuary.

Table 1.2

ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS BY TYPE OF PROVIDER
 FY 1967-87
 (in \$ millions)

Fiscal Year	Inpatient		Outpatient		Skilled Nursing		HHA 3/	
	Hospital		Hospital 1/	Physicians 2/			Pct. Change	Pct. Change
1967	2,729	---	25	----	1,049	----	147	---
1968	3,464	26.9	43	72.0	1,343	28.0	361	145.6
1969	4,200	21.2	79	83.7	1,598	19.0	416	15.2
1970	4,663	11.0	114	44.3	1,739	8.8	294	-29.3
1971	5,355	14.8	148	29.8	1,869	7.5	216	-26.5
1972	5,937	10.9	171	15.5	2,037	9.0	180	-16.7
1973	6,513	9.7	193	12.9	2,206	8.3	203	12.8
1974	7,945	22.0	381	77.4	2,641	19.7	255	25.6
1975	9,943	25.1	538	41.2	3,194	20.9	280	9.8
1976	11,808	18.8	751	39.6	3,802	19.0	318	13.6
78*	3,153	---	256	----	1,128	----	87	----
1977	14,508	----	1,076	----	4,725	----	352	----
1978	16,813	15.9	1,299	20.7	5,595	18.4	352	0.0
1979	19,299	14.8	1,576	21.3	6,619	18.3	366	4.0
1980	23,290	20.7	1,890	19.9	8,049	21.6	401	9.6
1981	27,891	19.8	2,279	20.6	9,690	20.4	439	9.5
1982	32,769	17.5	2,708	18.8	11,578	19.5	477	8.7
1983	37,222	13.6	3,188	17.7	13,817	19.3	522	9.4
1984	40,597	9.1	3,641	14.2	15,367	11.2	548	5.0
1985	43,893	8.1	4,176	14.7	16,610	8.1	570	4.0
1986	45,977	4.7	5,026	20.4	18,971	14.2	564	-1.1
1987	47,688	3.7	6,122	21.8	22,061	16.3	589	4.4
								2,489
								6.7

1/ Includes payments for routine maintenance dialysis treatments since FY 1974.

2/ Includes payments for inpatient radiology and pathology services, as well as durable medical equipment, ambulance, and several other non-physician services covered under Medicare Supplementary Medical Insurance.

3/ Includes payments under both Medicare Hospital Insurance and Supplementary Medical Insurance.

* Transitional quarter to adjust for change in start of Federal fiscal year from July 1 to October 1 in 1976.

Note: Payments on an incurred basis by type of provider are estimated and subject to change as more recent and complete data become available and estimates are revised.

Source: Health Care Financing Administration, Office of the Actuary.

Table 1.3
DISTRIBUTION OF ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS
BY TYPE OF PROVIDER
FY 1967-87

Fiscal Year	Inpatient Hospital	Outpatient Hospital	Physicians	Skilled Nursing	HHA	Other 1/
1967	58.1 %	9.6 %	26.2 %	3.7 %	0.8 %	0.5 %
1968	55.2	9.8	25.3	5.8	1.3	0.6
1969	55.4	1.2	24.9	6.5	1.5	0.6
1970	67.1	1.0	25.0	4.2	1.4	0.5
1971	59.4	1.9	24.2	2.8	1.1	0.5
1972	70.1	2.0	24.1	2.1	1.1	0.6
1973	70.1	2.1	23.8	2.2	1.2	0.6
1974	69.4	3.3	23.1	2.2	1.3	0.7
1975	69.5	3.9	22.3	2.0	1.7	0.8
1976	68.8	4.4	22.1	1.9	2.1	0.8
1977*	56.1	5.4	23.6	1.8	2.2	0.9
1977	68.1	5.0	22.2	1.7	2.2	0.8
1978	67.8	5.2	22.6	1.4	2.2	0.8
1979	67.1	5.5	23.0	1.3	2.3	0.9
1980	67.0	5.4	23.2	1.2	2.3	0.9
1981	66.9	5.5	23.2	1.1	2.3	1.0
1982	66.4	5.5	23.5	1.0	2.6	1.0
1983	65.2	5.6	24.2	0.9	3.0	1.1
1984	64.5	5.8	24.4	0.9	3.2	1.3
1985	64.0	6.1	24.2	0.8	3.2	1.7
1986	51.7	6.7	25.4	0.8	3.1	2.3
1987	59.7	7.5	27.1	0.7	3.1	2.8

1 Includes Independent Labs, GPPP and Hospice.

* Transitional quarter to adjust for change in start of Federal fiscal year from July 1 to October 1 in 1976.

Source: Health Care Financing Administration, Office of the Actuary.

Chapter 2

IMPACT ON MEDICARE BENEFICIARIES

Among the major objectives of the Medicare program under PPS are assurance of continued access to appropriate health care by Medicare beneficiaries and the maintenance of the quality of care provided to these beneficiaries. This is of particular concern under a payment system such as PPS where the financial incentives to hospitals encourage a more parsimonious use of services during a hospital stay. Lower levels of utilization need not, however, translate into concerns over access and quality. Indeed, the incentives under PPS may serve to encourage improvements in access and quality. For instance, improved hospital management, increased specialization of services, and elimination of unnecessary services may result in the increased effectiveness of care.

This chapter presents basic trend data on the utilization of short-stay hospital care by the Medicare population and summarizes several analytical studies of PPS impact on access to hospital care and on mortality. The analyses include data through calendar year 1986.

Beneficiary Access and Utilization

This section provides basic descriptive data on hospitalization rates for the elderly, the disabled, and the end stage renal disease (ESRD) Medicare populations. The variables of interest include the discharge rate (number of discharges per 1,000 enrolled persons), average length of

stay, and the days of care rate (number of days of care per 1,000 enrolled persons). In addition, data are presented on a diagnosis related group (DRG)-specific basis for the aged. Details of the methods used in this section can be found in last year's Impact Report (U.S. Department of Health and Human Services, 1989).

Medicare's Aged Population

Previous years' analyses had focused on trend comparisons between States operating under PPS and States operating under waivers of PPS (New York, Massachusetts, Maryland, and New Jersey). Although these States by no means represented a true control group, their systems were sufficiently different to warrant their use for general comparisons. In 1986, both New York and Massachusetts entered the national PPS system. It was decided, therefore, to discontinue the PPS/non-PPS comparisons and examine national trends for the Medicare program as a whole.

Table 2.1 shows Medicare utilization for persons 65 years of age and over for the years 1980 through 1986. From 1980 through 1983, the discharge rate in the U.S. increased from 371 per 1,000 beneficiaries to 394 per 1,000, an average annual increase of 2.1 percent. This was a continuation of the trend that had been observed since 1968. In 1984, the discharge rate declined (by 4.1 percent) for the first time since the beginning of Medicare. In 1985, the U.S. discharge rate declined to 330 per 1,000, a further decrease of 10.2 percent. This downward trend continued in 1986 with an additional 6.2 percent decline to 318 per 1,000. Since 1983, the net decline in discharges per 1,000 has been 19.2 percent.

There are at least two reasons for these declines. Peer Review Organizations (PROs) are actively engaged in admission screening. Hospital administrators and physicians often mention the effect of PROs in reducing inappropriate admissions. In addition, there is the effect of the increasing frequency of ambulatory surgery, particularly lens extractions. From 1983 to 1985, the number of Medicare admissions fell by 880,000. During the same time, lens extractions in the inpatient hospital setting fell by 300,000, accounting for over one-third of the total decline in admissions.

There was a very large decline in length of stay during the first year of PPS. In contrast to the trend in discharge rates, average length of stay had been steadily declining prior to the start of PPS—in fact, since the beginning of the Medicare program. From 1980 through 1983, average length of stay declined from 10.3 days to 9.6 days, an average annual decline of 2.3 percent. In 1984, the decline was 0.9 days, or 8.8 percent. Length of stay continued to decline in 1985, but at a greatly diminished rate, falling from 8.7 days to 8.4 days, a decrease of 3.9 percent. However, length of stay seems to have plateaued, remaining at 8.4 days in 1986. Since the beginning of PPS, the total decline in length of stay has been 12.0 percent.

The product of the discharge rate and the average length of stay is the total days of care rate. This rate had not changed much for the Medicare aged population during the 15 years prior to the advent of PPS because the rate at which discharges had been rising was offset by an almost equal rate of decline in the average length of stay. In 1984, however, the combination of a large decline in length of stay and the first-ever decline in discharges resulted in a 12.6 percent decline in the

days of care rate. The decrease in the days of care rate was somewhat larger in 1985 (13.7 percent). Although days of care continued to decline in 1986, the rate of decrease (5.9 percent) was less than one-half as great as in the previous 2 years. Still, the net impact has been significant. The days of care rate for Medicare aged beneficiaries was 29 percent lower in 1986 than 1983.

A major concern has been whether or not any changes in utilization rates fell disproportionately on high risk age, sex, and race groups with potential access problems. As shown in Table 2.1, however, declines in discharge rates since the introduction of PPS have been greater for younger persons than for older persons and greater for white beneficiaries than for persons of other races. Females have had a larger decrease in the discharge rate (20.3 percent) than have males (17.6 percent) even though they had a lower discharge rate in 1983. The reason for this is not clear. Because men and women have different patterns of admission, changes in overall discharge rates could affect them differentially. For instance, hospitalization for lens extraction was more common for females (19.5 per 1,000) than for males (14.3 per 1,000) in 1983. Thus, the movement of this procedure to outpatient settings had a larger impact on the total discharge rate for females than for males. Whether or not a change in the total discharge rate represents an access issue would depend on analyses of diagnosis specific discharge rates.

Length of stay is directly related to the age of the patient. Through 1985 there was a trend toward a narrowing of the age differential. In 1986 there were basically no meaningful changes in length of stay. None of the demographic groups experienced a change in length of stay of as much as 1 percent.

Due to the similarities of changes in discharge rates and lengths of stay, all population subgroups experienced similar decreases in days of care from 1983 to 1986, ranging from a 26.9 percent decrease for persons ages 85 and over to a 32.6 percent decrease for persons ages 65 to 69.

In summary, the data indicate that there has been little change in relative utilization levels across age, sex, or race categories. If the reductions in the discharge rate and length of stay represent decreased access, these decreases have been relatively evenly distributed across demographic categories. Similarly, to the extent that these reductions represent decreases in overuse, they have been equitable, at least in a statistical sense.

DRG-Specific Utilization Rates

As described in the last years' Impact Report, changes in DRG-specific utilization rates in the first year of PPS were quite large and generally believed to reflect, to a great extent, changes in coding practices. Consequently, only the changes that have taken place since 1984 are examined for DRG-specific discharge rates and average lengths of stay.

Discharge rates per 1,000 beneficiaries are shown in Table 2.2 for the 20 DRG combinations that had the highest rates nationwide in 1984. These groups account for almost one-half of all Medicare admissions among the elderly. Sixteen of these groups decreased in frequency from 1984 to 1986. The exceptions were pneumonia (1.1 percent increase), angina (3.6 percent increase), nutritional and miscellaneous metabolic disorders (17.5 percent), and major joint procedures (5.5 percent). The largest decreases were for lens procedures (89.1 percent) and atherosclerosis (76.2 percent).

Changes in length of stay are shown in Table 2.3 for the 20 DRG combinations with the longest lengths of stay in 1984. Nine of these DRGs had cumulative decreases of greater than 10 percent through 1986 with the greatest decreases for fracture of the hip/pelvis (18.4 percent) and vascular procedures, except major restoration (17.0 percent). Five of these DRGs have experienced increases since 1984; psychoses, stomach, esophageal, and duodenal procedures, degenerative nervous system disorders, lymphoma or leukemia, and organic disturbances and mental retardation. The relative stability of length of stay for some of these categories does not rule out large decreases between 1983 and 1984. However, the significant coding changes beginning in 1984 make analyses of pre-post DRG changes uncertain at best.

Medicare's Disabled Population

Table 2.4 shows utilization for disabled Medicare beneficiaries from 1980 through 1986. In the 3 years since PPS implementation, discharge rates have decreased by 8.4 percent, 6.0 percent, and 2.4 percent, respectively, for a total decrease of 15.9 percent between 1983 and 1986. Average length of stay for the disabled population declined in 1984 (8.2 percent) and in 1985 (3.0 percent). There was a marginal increase of 1.1 percent in 1986 resulting in a net decrease of 10.0 percent since PPS implementation. These trends are roughly similar to the declines in discharge rates and length of stay for the aged. Total days of care per 1,000 dropped by 24.4 percent for the disabled compared to the 29.0 percent decrease for the aged.

As with the aged, there were no striking differences in hospitalization changes across population subgroups. All experienced decreases in discharge rates (ranging from 12 percent to 19 percent), lengths of stay (ranging from 7 percent to 12 percent), and total days of care (ranging from 21 percent to 27 percent).

Medicare's ESRD Population

Table 2.5 shows hospital utilization for the Medicare ESRD population on dialysis. Unlike the aged and disabled populations, discharge rates for the ESRD population have remained relatively unchanged since the advent of PPS, increasing slightly from 1,206 per 1,000 in 1983 to 1,288 per 1,000 in 1986. Rates decreased for persons under age 15 (most likely due to erroneous inclusion of some transplant cases in the earlier years) and increased markedly for persons over age 65. The increase among the aged is probably due to the expansion of dialysis (in recent years) to sicker patients who would have not been considered good candidates for dialysis previously. Length of stay trends were very similar to those of the aged and disabled, a large decrease (11.5 percent in 1984), followed by a smaller decrease (2.3 percent) in 1985. Lengths of stay increased by 4.3 percent in 1986. The increased discharge rates have largely offset the decreased lengths of stay. Therefore, unlike the aged and disabled populations, where the number of hospital days per 1,000 persons has decreased by 24 to 29 percent, days of care rates among the ESRD population is down by about 10 percent for most age groups and is up by 7 percent among those over age 65.

Rehospitalization

Rehospitalization rates can reflect outcomes of care to the extent that premature discharge or poor quality of care results in the need for a patient to return to the hospital for additional treatment. Thus, an increase in readmissions might indirectly indicate a change in the quality of care. It is also true, however, that rehospitalizations can (a) represent normal progression of the disease, (b) be indicative of appropriate treatment patterns, or (c) be related to the severity of illness of the patient. A

good example is DRG 82, respiratory neoplasms. This DRG has the highest rate of rehospitalizations (for live discharges) of any DRG category. Over 50 percent of the rehospitalizations are for respiratory neoplasms (DRG 82), chemotherapy (DRG 410), and major chest procedures (DRG 75). Repeat hospitalizations for respiratory neoplasms could very well represent progression of the disease. Chemotherapy and major chest procedures are active treatments of the disease. Similarly, over 50 percent of the rehospitalizations for disorders of the biliary tract (DRG 207) are for cholecystectomy (DRGs 195 and 197). Still, it is of interest to examine trends in rehospitalization, especially for selected conditions.

Table 2.6 shows 30 day post-discharge rehospitalization rates for the years 1981 through 1986 for the Medicare population ¹. Across all diagnoses, the rehospitalization rate increased from 17.9 percent in 1981 to 19.5 percent in 1986. However, much of the increase occurred prior to the introduction of PPS in 1984. The rate of rehospitalization varies considerably by condition ranging, in 1986, from 7.2 percent for hernia repair to 21.8 percent for stroke.

A multivariate trend analysis was performed to test for a PPS effect. The multivariate analysis controlled for patient, hospital, and area characteristics. In addition, it included limited characteristics of the stay such as use of intensive care or coronary care unit days, indication of surgery, and previous hospital use in the 60 days prior to admission. This analysis showed a significant effect of PPS on the probability of

¹The data for this table were taken from "Readmissions and Transfers: The Effects of PPS." - Abt Associates - November 8, 1988 Working Paper.

rehospitalization. That is, rehospitalization tended to rise after the introduction of PPS (holding other factors constant), although the effect varied substantially across tracer categories. The effect was generally larger for surgical conditions.

Table 2.6 also shows rehospitalizations thought to be related to complications of therapy (building on prior work conducted by Roos, et al.) for the two surgical procedures, hernia repair and hip replacement. These also show increases over time, from 0.8 percent in 1981 to 1.8 percent in 1986 for hernia repair and 3.0 percent to 4.1 percent for hip replacement. Multivariate analyses showed the increase to be associated with PPS implementation.

In summary, there has been a trend toward increasing rehospitalization which predates the implementation of PPS. Nevertheless, there is some evidence for a PPS effect over the time trend. Unfortunately, these analyses cannot adequately control for patient severity (the hospital discharge data prior to 1984 contains no information on co-morbid or complicating conditions). Aggregate data from HCFA's Health Standards and Quality Bureau show that, since 1984, the percentage of persons with only one hospitalization during a year has increased. This suggests that a decrease in overall rehospitalization rates occurred. Other analyses of severity at discharge and mortality rates (discussed later in this chapter) suggest that patient severity has increased since the beginning of PPS. In addition, the reasons for rehospitalization are not well understood. As discussed earlier, many (perhaps most) rehospitalizations are to be expected given the progress of the disease and therapy plan. The data in this section raise questions about the whole issue of rehospitalization and its interpretation which will need to be addressed in future work.

Mortality

In previous years, the PPS Impact Report included analyses of basic population-based mortality rates among the aged, disabled, and ESRD populations. As discussed in last year's report (DHHS 1989), the accuracy of a time trend model for predicting an expected rate declines as one moves farther beyond the baseline projection years. In addition, population-based analyses are hampered by attribution problems because there are so many other influences on mortality besides the quality of medical care. For these reasons, population based mortality rates have been dropped from this report. The mortality analysis included in this year's report is based on 30 day post-admission mortality and is an extension of last year's severity adjusted mortality analysis.

Hospital-Related Mortality

There are inherent problems in analyzing hospital-related mortality. Foremost among these is the problem of variations in case mix. Hospitalized patients, by definition, represent a highly selective group of persons. The decision to hospitalize a patient is based on a variety of factors, including individual physician practice patterns, practice patterns within the specific geographical area, patient preference, payment incentives, and, more recently, oversight functions of PROs. All of these factors, in addition to the basic condition of the patient, influence the hospitalization decision.

As described in the discussion of access and utilization above, there has been an unprecedented decrease in Medicare discharge rates since the advent of PPS. To the extent that these decreases occurred among categories of patients who are less severely ill, and thus at low risk of dying, the resulting pool of hospitalized patients is, on average, more severely ill, and consequently, at greater risk of death. Therefore, it is important that

any analysis of trends in hospital-related mortality address the issue of changing case mix.

The decline in admissions may have resulted in intra-diagnostic, as well as inter-diagnostic, changes in severity. This hypothesis was tested in a study using the computerized disease staging methodology developed by Systemetrics/McGraw Hill (Gonnella, 1986). Disease staging was used because it was developed for the purpose of measuring severity of disease in terms of likelihood of death or residual impairment, and it can be generated from the MedPAR data set without additional medical record abstraction. The specifics of this analysis were described in the 1986 PPS Impact Report using 1985 data. The analysis below is an extension of that analysis to 1986 data.

The primary objective of this analysis is to determine whether or not there has been a change in 30 day post-admission mortality from 1984 to 1986 among Medicare patients, after adjusting for changes in case mix severity. A total of 819 risk-homogenous groups have been developed, which account for mortality risk differential based on disease, stage of disease, presence of high risk comorbidity, age, and sex. These groups are roughly analogous to the DRG groupings based on payment. That is, just as the DRGs are representative of groups of patients for whom costs are relatively similar, the 819 groupings in this analysis are groupings of patients for whom the probability of death within 30 days of admission is similar.

A comparison of FY 1986 Medicare hospital mortality rates with expected mortality rates based on the severity adjustment procedure described above is presented in Table 2.8. The table shows total discharges, actual percent dead, expected percent dead (based on 1984 mortality rates), and the standardized mortality ratio (SMR) for each of the 31 high mortality diseases and the four groups of low mortality diseases. The SMR is the ratio of the

actual mortality to the expected mortality. Ratios less than 1.0 represent cases in which the actual mortality is less than would have been expected, given the FY 1986 severity levels, and ratios greater than 1.0 represent cases in which the actual mortality is greater than would have been expected, given the FY 1986 severity levels.

Of the 35 disease groupings, there were 20 in which the SMR was less than 1.0 and 15 in which the SMR was greater than 1.0. The lowest SMR (0.70) was for other general conditions (an actual mortality rate of 3.3 percent versus an expected rate of 4.7 percent) and the highest SMR (1.23) was for the residual group of 350 diseases which had been grouped solely on the basis of 16 body systems (an actual mortality rate of 2.5 percent versus an expected rate of 2.0 percent).

Overall, the severity classification system accounted for essentially all of the increase in mortality between FY 1984 and FY 1986. The mortality rate for FY 1984 was 6.6 percent, so, all things being equal, the expected mortality rate for FY 1986 would also have been 6.6 percent, considerably below the observed FY 1986 rate of 7.5 percent. Controlling for disease category, stage of illness, high risk comorbidity, age, and sex resulted in an expected mortality rate for FY 1986 of 7.6 percent, slightly higher than the observed rate of 7.5 percent.

There are two limitations to this analysis that must be considered. First, there is the possibility that much of the observed increase in stage of illness and comorbidities is due to coding or "DRG creep." A study by Carter and Ginsburg (1985) showed that there was an initial increase in case mix (as measured by the case mix index or CMI), which was largely due to coding practice changes. The CMI continued to increase through FY 1985, but less of that change could be attributed to coding practices (Carter and

Ginsburg, 1986). Still, coding creep remains as a possible explanation for some of the observed increase in severity. This problem is not unique to this study but is relevant to any analysis of hospitalization data that uses case mix adjustment techniques based on diagnostic codes. Second, the computerized staging method used in this analysis relies, of necessity, on the information available on the MedPAR files. As such, it permits a limited characterization of severity of illness. The principal diagnosis reflects the cause of the admission. The remaining secondary diagnosis (up to four) include conditions present at admission as well as conditions and complications encountered during the stay itself. Using these data, it is not possible to clearly differentiate between conditions present at admission and conditions arising as a result of the stay itself. Although an attempt was made to eliminate severity that could have been caused by the stay, when possible (particularly for unrelated comorbidities), it is possible that some of the measured increase in severity could have been caused by the care provided rather than the condition of the patients on admission.

Episodes of Care

One of the concerns about PPS is that elements of care will be shifted from the inpatient to the outpatient setting, thus offsetting some of the efficiencies gained during the initial hospitalization. This was tested by creating episodes of hospitalization beginning 30 days prior to a hospitalization and extending 30 days after discharge from the hospital. All Part A and Part B payments occurring during this time window were treated as being associated with a target hospital stay. In this way it is possible to determine the extent to which the patterns of care surrounding individual hospitalizations have changed.

The results of these analyses are summarized in Table 2.7 for four tracer conditions (pneumonia, hip replacement, stroke and hernia repair) for the years 1981 through 1986. The table shows lengths of stay, use of post-hospital care in the first 7 days after discharge, and total Part A and Part B episode Medicare expenditures from 30 days prior to admission until 30 days after discharge. Length of stay declined for each of the four conditions while use of HHAs and/or SNFs increased for each of the conditions. For instance, 6.7 percent of live discharges for simple pneumonia resulted in an HHA or SNF service in 1981. By 1986 this had risen to 14.2 percent. Similarly, hip replacement discharges resulting in one of these services increased from 38.7 percent in 1981 to 53.0 percent in 1986. There were increases for stroke and hernia repair patients as well.

In terms of episode costs, the inpatient stay accounted for most of the total costs of each type of condition, ranging from 80.4 percent of costs for stroke patients to 90.8 percent for hernia repair patients, in 1981. The lower percent accounted for by inpatient care for stroke patients reflects the higher use of skilled nursing and home health care in the post-hospital period for these patients whereas the higher percent accounted for by inpatient care for hernia repair patients reflects the fact that little pre- or post-hospital care is typically used by these patients. Interestingly, despite the fact that 50 percent of hip fracture patients use some post-hospital care (in 1986), this still does not account for much of the total episode costs (only 7.8 percent in 1986 for "C-Pst w/o Rehsp", which are the costs of post-hospital care not including the costs of rehospitalization). This is due to the fact that inpatient care is so much more expensive than the subacute care of home health and skilled nursing care.

From 1981 to 1986, total episode costs (unadjusted for inflation) increased for each of the tracer conditions, ranging from a 57 percent increase for hip replacement cases to a 23 percent increase for hernia repairs. In each of the conditions, there was a gradual shift of episode costs from the inpatient to other parts of the episode, primarily the post-discharge period. For instance, for simple pneumonia, the inpatient stay accounted for 83.1 percent of episode costs in 1981 and 79.3 percent in 1986. The greatest change was for stroke episodes in which the inpatient portion declined from 80.4 percent of the total episode costs in 1981 to 72.7 percent in 1986. This can also be viewed in terms of annual rates of change. For simple pneumonia cases, total episode costs increased at an annual rate of 7.8 percent during this time period. The inpatient component of episode costs for simple pneumonia cases increased at an annual rate of 6.8 percent while the remaining episode costs increased at an annual rate of 12.2 percent. Therefore, there is some evidence of a substitution effect in terms of shortened lengths of stay and increased post-hospital use. In addition, the proportion of the hospital episode costs due to the inpatient stay has declined slightly. However, the hospitalization itself still accounts for the bulk of episode costs (between 73 percent and 85 percent, depending on the condition). This study's findings are discussed in further detail in Chapter 3.

References

1. "A Review of Published Literature on PPS Impacts" - November 8, 1988.
2. "Program Statistics on Trends in Hospital Utilization - Gary Gaumer and Teresa Fama - August 31, 1988.
3. "Changes in Patient Severity and Hospital Utilization Measured with Medisgroups" - Monica Noether - August 24, 1988.
4. "Readmissions and Transfers: The Effects of PPS" - Monica Noether - November 8, 1988.
5. "Selection of Tracers in Studies of PPS and Service Utilization" - Cary Sennett - November 8, 1988.
6. "Episodes of Hospitalization and PPS" - Gary Gaumer and Teresa Fama - September 21, 1988.
7. "Effects of PPS and Per Capita Medicare Utilization: 1981-1986" - Robert Schmitz - November 16, 1988.
8. Roos, Leslie, et al. "Using Computers to Identify Complications for Surgery." American Journal of Public Health 75:1288-1295.

Table 2.1

Discharges per 1,000 beneficiaries, average length of stay,
days of care per 1,000 beneficiaries and percent change for aged Medicare
beneficiaries, U.S. Total by Age, Sex, and Race: 1980 through 1986

Age, sex and race	Calendar year							Average Annual Percent Change				Total Change
	1980	1981	1982	1983	1984	1985	1986	1980-83	1983-84	1984-85	1985-86	
<u>Discharges per 1,000</u>												
Total	371	380	387	394	378	339	318	2.1	-4.1	-10.2	-6.2	-19.2
Age												
65-69	287	294	292	295	278	244	227	0.9	-5.8	-11.9	-7.0	-22.8
70-74	344	351	358	365	349	312	293	2.0	-4.4	-10.4	-6.3	-19.8
75-79	414	424	434	443	425	381	355	2.3	-4.0	-10.4	-6.7	-19.7
80-84	474	490	503	513	494	448	421	2.8	-3.7	-9.2	-6.2	-18.0
85+	518	527	545	556	542	498	474	2.4	-2.5	-8.2	-4.7	-14.8
Sex												
Male	402	410	413	421	402	367	347	1.6	-4.4	-8.8	-5.5	-17.6
Female	350	359	370	376	361	321	300	2.5	-3.9	-11.1	-6.6	-20.3
Race												
White	376	386	392	399	382	342	322	2.0	-4.2	-10.5	-5.9	-19.3
Other	326	335	350	357	344	319	292	3.1	-3.6	-7.4	-8.6	-18.4
<u>Average Length of Stay</u>												
Total	10.3	10.1	9.9	9.6	8.7	8.4	8.4	-2.3	-8.8	-3.9	0.4	-12.0
65-69	9.4	9.2	9.1	8.8	8.1	7.7	7.7	-2.2	-8.4	-4.2	-0.6	-12.7
70-74	9.9	9.7	9.6	9.3	8.5	8.2	8.2	-2.2	-8.6	-3.1	0.3	-11.1
75-79	10.5	10.2	10.1	9.7	8.9	8.6	8.6	-2.4	-9.0	-3.6	0.8	-11.5
80-84	11.0	10.8	10.6	10.2	9.2	8.8	8.9	-2.6	-9.3	-4.0	0.6	-12.4
85+	11.4	11.2	11.0	10.6	9.6	9.0	9.1	-2.5	-9.3	-5.8	0.4	-14.2
Sex												
Male	9.9	9.7	9.6	9.3	8.6	8.2	8.2	-2.0	-8.3	-4.4	0.0	-12.3
Female	10.5	10.3	10.1	9.8	8.9	8.6	8.6	-2.5	-9.1	-3.5	0.6	-11.8
Race												
White	10.1	9.9	9.8	9.5	8.8	8.3	8.3	-2.3	-8.7	-4.0	0.3	-12.1
Other	11.3	11.1	11.0	10.6	9.6	9.2	9.3	-2.1	-9.6	-3.8	0.9	-12.3
<u>Total Days of Care per 1,000</u>												
Total	3,804	3,820	3,841	3,777	3,302	2,850	2,683	-0.2	-12.6	-13.7	-5.9	-29.0
Age												
65-69	2,692	2,699	2,648	2,592	2,237	1,888	1,746	-1.2	-13.7	-15.6	-7.5	-32.6
70-74	3,407	3,412	3,427	3,376	2,948	2,561	2,407	-0.3	-12.7	-13.1	-6.0	-28.7
75-79	4,329	4,338	4,376	4,313	3,770	3,256	3,064	-0.1	-12.6	-13.6	-5.9	-29.0
80-84	5,207	5,282	5,318	5,211	4,549	3,962	3,741	0.0	-12.7	-12.9	-5.8	-28.2
85+	5,928	5,905	6,001	5,888	5,205	4,501	4,306	-0.2	-11.6	-13.5	-4.3	-26.9
Sex												
Male	3,982	3,996	3,975	3,927	3,441	2,999	2,836	-0.5	-12.4	-12.8	-5.5	-27.8
Female	3,683	3,701	3,750	3,676	3,209	2,750	2,585	-0.1	-12.7	-14.3	-6.0	-29.7
Race												
White	3,818	3,831	3,840	3,775	3,302	2,838	2,679	-0.4	-12.5	-14.1	-5.8	-29.0
Other	3,695	3,734	3,850	3,794	3,305	2,944	2,715	0.9	-12.9	-10.9	-7.8	-28.5

Source: MedPar/Patbill Files and Medicare Enrollment Counts, 1980 to 1986

Table 2.2

Discharges per 1,000 aged Medicare beneficiaries and percent change for the 20 most common DRGs in 1984: 1984 to 1986

Diagnosis Related Group	Title	Discharges per 1,000			Percent Change		
		1984	1985	1986	84-85	85-86	84-86
127	HEART FAIL & SHOCK	18.6	18.3	16.4	-1.6	-10.5	-11.9
182-184	ESO/GASTRO/MISC DIG	16.9	13.0	10.7	-23.0	-18.1	-36.9
039	LENS PROCEDURES	16.8	5.9	1.8	-64.6	-69.2	-89.1
089-091	PNEUMONIA	12.3	13.2	12.4	7.6	-6.0	1.1
121-123	AMI	12.1	11.9	10.7	-1.3	-10.3	-11.5
014	SPEC CEREBRO. DIS	11.8	11.8	10.7	-0.3	-9.1	-9.4
140	ANGINA	10.7	11.6	11.1	8.7	-4.7	3.6
138-139	CARD ARRHYTHMIA	9.0	8.5	7.8	-5.5	-8.0	-13.1
088	CHR OBSTR PUL DIS	7.7	5.9	5.0	-24.1	-15.3	-35.7
096-098	BRONCHITIS	7.2	7.1	6.8	-2.2	-3.9	-6.0
243	BACK PROBLEMS	7.1	5.9	4.7	-17.7	-19.9	-34.0
336-337	PROSTACTECT. *	17.2	17.2	16.2	0.0	-5.4	-5.4
015	TR ISCHEMIC ATT	6.7	6.4	5.5	-3.9	-13.6	-17.0
296-298	NUTRI/MIS METABOL DIS	6.2	7.7	7.3	22.8	-4.3	17.5
174-175	G.I. HEMORR	5.7	5.9	5.4	4.2	-9.1	-5.3
468	UNRELATED OR PROC	5.6	5.0	4.4	-12.0	-11.1	-21.8
209	MAJ JOINT PROCS	5.6	5.9	5.9	6.8	-1.2	5.5
320-322	KID INFECT.	5.5	5.2	5.3	-5.7	1.6	-4.2
132-133	ATHEROSCLEROSIS	5.2	2.1	1.2	-59.9	-40.5	-76.2
294-295	DIABETES	5.0	3.9	3.3	-22.4	-14.8	-33.9
Sub-Total		182.6	162.1	142.9	-11.2	-11.8	-21.7

Source: MedPAR/Patbill Files and Medicare Enrollment Counts, 1980 to 1986

* = Rates for prostatectomy are based on male enrollment only.

Table 2.3

Average length of stay for aged Medicare beneficiaries and
percent change for the 20 DRGs
with the longest stays in 1984: 1984 to 1986

Diagnosis Related Group	Title	Average length of stay			Percent Change		
		1984	1985	1986	84-85	85-86	84-86
148-149	MAJ BOWEL PROCS	17.3	16.1	15.9	-7.1	-1.5	-8.5
210-212	HIP/FEM PROCS	16.8	15.0	14.4	-10.9	-4.2	-14.6
468	UNRELATED OR PROC	16.6	14.9	14.8	-10.3	-0.5	-10.8
209	MAJ JOINT PROCS	16.0	14.3	13.6	-10.4	-4.8	-14.7
110-111	MAJ RECON VASC PROCS	15.7	14.8	14.7	-5.5	-1.1	-6.5
430	PSYCHOSES	15.3	15.9	16.1	4.4	1.1	5.5
154-156	STO/ESO/DUO PROCS	14.4	15.9	15.7	10.8	-1.2	9.4
195-198	CHOLECYSTECTOMY	12.6	11.6	11.2	-8.3	-3.2	-11.2
236	FRACT HIP/PELVIS	12.2	11.1	10.0	-9.0	-10.2	-18.4
112	VASC PROCS EXC MAJ RE	12.2	11.7	10.1	-3.5	-13.9	-17.0
014	SPEC CEREBRO. DIS	12.1	10.9	10.6	-9.8	-3.3	-12.7
416-417	SEPTICEMIA	11.4	10.6	10.5	-7.1	-0.5	-7.6
012	DEGEN NERVOUS SYS DIS	11.0	12.6	12.1	14.0	-3.6	10.0
316	RENAL FAIL	10.5	9.7	9.5	-8.2	-1.3	-9.4
413-414	OTH MYELO/NEOPLAMS	10.2	9.7	9.5	-5.6	-1.6	-7.1
403-405	LYMPH -LEUKEMIA	10.2	10.6	10.9	4.3	3.0	7.4
429	ORG DIST & M.R.	10.2	10.4	10.8	2.8	3.5	6.5
087	PUL EDEMA/ RESP FAIL	10.1	9.5	9.3	-5.5	-2.1	-7.4
121-123	AMI	10.1	9.3	8.9	-7.5	-4.3	-11.5
203	MALIG - HEP, PAN	9.9	9.4	9.1	-5.3	-2.3	-7.5
Sub-Total		13.0	12.2	11.9	-6.5	-1.8	-8.3

Source: MedPAR/Patbill Files, 1980 to 1986

Table 2.4

Discharges per 1,000 beneficiaries, average length of stay,
days of care per 1,000 beneficiaries and percent change for disabled
beneficiaries, U.S. Total by Age, Sex, and Race: 1980 through 1986

Age, sex and race	Calendar year							1980-83	1983-84	1984-85	1985-86	1983-86 Total Change
	1980	1981	1982	1983	1984	1985	1986					
<u>Discharges per 1,000</u>												
Total	390	397	405	407	373	351	343	1.5	-8.4	-6.0	-2.4	-15.9
Age												
0-44 years	288	292	304	304	256	261	258	1.9	-15.8	-1.8	-1.1	-15.3
45-54 years	390	404	409	418	381	354	341	2.4	-8.9	-7.2	-3.8	-18.6
55-64 years	434	444	452	454	434	402	399	1.6	-4.4	-7.5	-0.7	-12.1
Sex												
Male	362	371	377	381	346	330	323	1.7	-9.0	-4.6	-2.2	-15.1
Female	437	441	452	453	420	387	376	1.2	-7.3	-7.9	-2.7	-17.0
Race												
White	402	409	416	418	383	359	350	1.3	-8.3	-6.3	-2.6	-16.4
Other	333	343	356	362	332	318	314	2.8	-8.2	-4.4	-1.0	-13.1
<u>Average Length of Stay</u>												
Total	9.6	9.5	9.5	9.3	8.5	8.3	8.3	-1.0	-8.2	-3.0	1.1	-10.0
Age												
0-44 years	9.1	9.5	9.5	9.5	8.7	8.7	8.9	1.5	-8.7	0.1	2.1	-6.7
45-54 years	9.2	9.1	9.2	9.0	8.3	8.0	8.1	-0.6	-8.4	-3.3	1.0	-10.5
55-64 years	9.8	9.7	9.5	9.3	8.6	8.2	8.2	-1.7	-8.1	-4.2	0.5	-11.5
Sex												
Male	9.3	9.2	9.2	9.0	8.3	8.1	8.2	-1.0	-7.8	-2.7	1.2	-9.3
Female	10.0	9.9	9.9	9.7	8.8	8.5	8.6	-1.1	-8.8	-3.3	1.1	-10.8
Race												
White	9.4	9.3	9.3	9.1	8.4	8.1	8.2	-1.0	-8.1	-2.9	1.1	-9.8
Other	10.6	10.4	10.5	10.2	9.3	8.9	9.0	-1.3	-9.0	-3.7	0.7	-11.8
<u>Days of Care per 1,000</u>												
Total	3,734	3,770	3,828	3,782	3,180	2,899	2,860	0.4	-15.9	-8.8	-1.3	-24.4
Age												
0-44 years	2,621	2,762	2,896	2,895	2,225	2,267	2,289	3.4	-23.1	1.9	1.0	-20.9
45-54 years	3,582	3,662	3,748	3,769	3,146	2,823	2,745	1.7	-16.5	-10.3	-2.8	-27.2
55-64 years	4,250	4,298	4,312	4,225	3,713	3,292	3,285	-0.2	-12.1	-11.3	-0.2	-22.2
Sex												
Male	3,361	3,428	3,461	3,431	2,877	2,668	2,639	0.7	-16.2	-7.2	-1.1	-23.1
Female	4,373	4,356	4,457	4,383	3,707	3,301	3,245	0.1	-15.4	-11.0	-1.7	-26.0
Race												
White	3,780	3,813	3,850	3,806	3,205	2,916	2,870	0.2	-15.8	-9.0	-1.6	-24.6
Other	3,526	3,578	3,730	3,678	3,074	2,830	2,821	1.4	-16.4	-7.9	-0.3	-23.3

SOURCE: MEDPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1986

Table 2.5

Discharges per 1,000 beneficiaries, average length of stay,
 days of care per 1,000 beneficiaries and percent change for end stage renal disease
 Medicare beneficiaries on dialysis, U.S. Total by Age: 1981 through 1986

Age	Calendar year						1981-83	1983-84	1984-85	1985-86	1983-86
	1981	1982	1983	1984	1985	1986					
	<u>Discharges per 1,000</u>						<u>Average Annual Percent Change</u>				
Total	1,221	1,166	1,206	1,240	1,221	1,288	-0.4	2.9	-1.6	5.5	6.9
0-14	1,392	1,533	1,523	1,081	879	950	3.0	-29.0	-18.7	8.1	-37.6
15-24	1,075	1,096	1,069	1,010	939	1,020	-0.2	-5.6	-7.0	8.6	-4.6
25-34	1,062	1,109	1,085	1,062	1,033	1,127	0.7	-2.2	-2.7	9.1	3.8
35-44	1,105	1,117	1,117	1,118	1,067	1,112	0.3	0.2	-4.6	4.2	-0.5
45-54	1,158	1,137	1,197	1,143	1,150	1,171	1.1	-4.5	0.6	1.9	-2.1
55-64	1,276	1,262	1,264	1,285	1,230	1,261	-0.3	1.7	-4.3	2.5	-0.2
65+	1,376	1,139	1,256	1,410	1,399	1,513	-3.0	12.2	-0.8	8.2	20.4
	<u>Average Length of Stay</u>										
Total	10.3	10.1	10.0	8.8	8.6	9.0	-0.9	-11.5	-2.3	4.3	-9.8
0-14	9.6	9.5	9.4	8.5	8.7	9.2	-0.5	-10.0	3.1	4.7	-2.8
15-24	9.2	8.7	8.4	7.3	7.2	7.3	-2.9	-13.3	-1.4	1.7	-13.1
25-34	9.6	9.0	8.8	7.8	7.6	7.7	-3.0	-11.2	-2.3	0.6	-12.7
35-44	9.9	9.6	9.2	8.1	7.9	8.2	-2.3	-11.7	-2.9	4.1	-10.7
45-54	9.8	9.7	9.5	8.3	8.2	8.6	-0.8	-13.0	-1.3	4.8	-10.0
55-64	10.3	10.4	10.1	8.9	8.5	8.9	-0.5	-12.2	-4.1	4.4	-12.2
65+	11.2	10.8	11.1	9.7	9.4	9.9	-0.5	-12.0	-3.0	4.4	-10.9
	<u>Days of Care per 1,000</u>										
TOTAL	12,559	11,723	12,050	10,969	10,553	11,616	-1.4	-9.0	-3.8	10.1	-3.6
0-14	13,294	14,570	14,345	9,170	7,687	8,699	2.8	-38.1	-18.2	13.2	-39.4
15-24	9,864	9,484	8,998	7,365	6,754	7,480	-3.0	-18.2	-8.3	10.5	-17.1
25-34	10,214	9,963	9,541	8,287	7,883	8,850	-2.2	-13.1	-4.9	9.7	-9.3
35-44	10,929	10,737	10,307	9,113	8,447	9,162	-1.9	-11.6	-7.3	8.5	-11.1
45-54	11,291	11,056	11,408	9,476	9,416	10,048	0.3	-18.9	-0.6	6.7	-11.9
55-64	13,139	13,134	12,825	11,449	10,506	11,240	-0.8	-10.7	-8.2	7.0	-12.4
65+	15,456	12,343	13,895	13,721	13,204	14,903	-3.5	-1.3	-3.8	12.9	7.3

Source: HCFA, BDMS, OSDM, ESRD Program Management and Medical Information System data: 1981 to 1986

Table 2.6

Readmissions within 30 days of live discharge
for aged Medicare beneficiaries
All diagnoses and selected conditions: 1981 to 1986

Condition	1981	1982	1983	1984	1985	1986
Percent with readmissions						
All diagnoses	17.9	19.1	18.8	19.0	20.0	19.5
Hernia repair	4.5	5.4	5.5	6.1	6.2	7.2
Hip replacement	9.4	10.6	10.3	11.2	11.1	12.6
Pneumonia	16.8	17.4	18.0	17.5	17.5	17.6
Stroke	19.6	21.3	21.0	22.1	22.9	21.8
Percent with readmissions for complications						
Hernia repair	0.8	1.4	1.3	1.5	1.4	1.8
Hip replacement	3.0	2.9	3.8	4.1	4.3	4.1

Adapted from, "Readmissions and Transfers: The Effects of PPS", Contract Report from Abt Associates, November, 1988.

Table 2.7

Average length of stay, post hospital utilization, and total episode costs for four tracer conditions: 1981 to 1986

	1981	1982	Year 1983	1984	1985	1986
<u>Simple Pneumonia</u>						
N of cases	4,809	4,984	4,841	4,547	4,476	4,352
Length of stay	9.9	10.3	9.9	8.6	8.1	8.3
HHA and/or SNF in 7 days (%)	6.7	8.2	10.3	11.0	13.1	14.2
Episode costs	\$3,216	\$3,747	\$4,110	\$4,208	\$4,475	\$4,676
Costs-pre (%)	2.8	2.5	2.8	3.2	3.7	3.8
Costs-Hosp (%)	83.1	83.1	82.1	80.5	79.7	79.3
Costs-Post (%)	14.1	14.4	15.2	16.3	16.6	17.0
C-Pst(w/o)Rehsp	3.3	3.3	3.7	4.0	4.7	5.1
<u>Hip Replacement - fracture</u>						
N of cases	640	988	1,443	1,913	2,072	1,829
Length of stay	18.1	17.5	16.9	14.9	13.8	13.3
HHA and/or SNF in 7 days (%)	38.7	44.1	46.4	48.5	52.5	53.0
Episode costs	\$7,058	\$7,924	\$8,418	\$9,758	\$10,580	\$11,065
Costs-pre (%)	1.8	1.6	1.4	1.6	1.7	1.7
Costs-Hosp (%)	87.4	86.4	86.5	86.2	85.7	85.0
Costs-Post (%)	10.7	12.0	12.1	12.2	12.6	13.4
C-Pst(w/o)Rehsp	7.3	7.2	7.4	7.2	7.6	7.8
<u>Stroke - Transient Ischemic Attacks</u>						
N of cases	4,068	3,919	3,771	3,799	3,827	3,991
Length of stay	7.1	7.7	6.6	4.9	4.5	4.5
HHA and/or SNF in 7 days (%)	5.4	5.1	6.8	6.3	7.1	7.2
Episode costs	\$4,246	\$5,242	\$5,729	\$6,031	\$6,560	\$6,571
Costs-pre (%)	2.2	2.1	2.3	2.3	2.6	2.5
Costs-Hosp (%)	80.4	79.1	78.0	74.9	73.3	72.7
Costs-Post (%)	17.5	18.9	19.8	22.8	24.2	24.8
C-Pst(w/o)Rehsp	6.0	5.6	6.1	6.9	7.1	7.4
<u>Hernia Repair - Unilateral</u>						
N of cases	1,715	2,079	2,582	2,873	2,346	1,810
Length of stay	5.8	5.3	5.1	4.2	3.8	3.5
HHA and/or SNF in 7 days (%)	1.1	1.0	1.9	1.8	2.3	2.6
Episode costs	\$2,118	\$2,182	\$2,293	\$2,572	\$2,710	\$2,595
Costs-pre (%)	2.6	2.7	2.4	2.5	3.2	3.5
Costs-Hosp (%)	90.8	89.2	90.9	89.1	88.2	85.7
Costs-Post (%)	6.6	8.0	6.8	8.5	8.7	11.2
C-Pst(w/o)Rehsp	2.4	2.3	2.2	2.2	2.4	2.9

Adapted from "Episodes of Hospitalization and PPS", contract report from Abt Associates, September, 1988.

Table 2.8

30 Day Post Admission Mortality Rates for Medicare
FY 1986, by Selected Disease Categories

Disease Category		Total Discharges	Actual Percent Dead	Expected Percent Dead	Standardized Mortality Ratio
215	Head Injury, including intracranial	35,818	9.0	9.4	0.95 **
242	Alcoholism	75,932	4.6	4.6	1.00
251	Cerebrovascular Disease	381,204	12.5	12.7	0.99 *
290	Other Nervous System Conditions	75,721	4.4	3.5	1.26 **
504	Bacterial Pneumonia	407,278	16.4	17.2	0.96 **
525	Bronchitis/Obstructive Pulmonary Disease	328,450	7.4	6.8	1.08 **
527	Cancer - Lung	129,658	25.7	25.3	1.02 **
590	Other Respiratory Conditions	250,252	10.2	10.2	0.99
620	Vascular Insufficiency of Intestine	14,517	30.3	33.4	0.91 **
624	Cancer - Colon and Rectum	109,482	11.1	13.3	0.84 **
690	Other Gastrointestinal Conditions	244,043	8.7	8.7	0.99
704	Cirrhosis of the Liver	23,045	20.4	19.9	1.03
710	Cancer - Pancreas	21,402	31.5	32.6	0.97 **
808	Tibia, Iliac, Femoral or Pop. Artery Dx	80,206	6.7	6.9	0.98
813	Aneurysm, Abdominal	35,543	18.0	18.1	1.00
815	Coronary Artery Disease (Acute MI)	1,066,528	9.7	11.0	0.89 **
821	Arrhythmias/Condition Disorders	448,543	6.5	6.8	0.96 **
822	Disease of Aortic Valve	40,221	8.5	8.9	0.95 **
829	Essential Hypertension	295,558	6.7	6.9	0.96 **
890	Other Cardiovascular Conditions	345,729	11.2	12.1	0.93 **
901	Urinary Tract Infections	183,239	9.1	8.0	1.14 **
902	Acute Renal Failure	52,284	21.7	22.1	0.98 *
903	Cancer - Genitourinary	58,557	4.8	5.4	0.90 **
1001	Carcinoma - Prostate	100,516	7.5	8.3	0.90 **
1214	Diabetes Mellitus	226,649	5.7	5.7	1.00
1290	Other Endocrin/Metabolic Conditions	214,493	12.1	11.1	1.09 **
1305	Acute Granulocytic Leukemia	7,244	34.2	30.3	1.13 **
1690	Other Bacterial Diseases	28,172	28.0	28.9	0.97 **
1691	Other Neoplasms	52,202	13.0	12.9	1.01
1693	Other General Conditions	235,609	3.3	4.7	0.70 **
1698	Carcinoma - Unstated Primary	59,169	28.8	26.6	1.08 **
grp 1	5 Diseases: StageComorb.	543,261	7.6	7.8	0.98 **
grp 2	14 Diseases: Stage	909,633	5.0	4.5	1.10 **
grp 3	31 Diseases	1,470,557	3.2	2.8	1.14 **
grp 4	16 Body Systems	1,506,708	2.5	2.0	1.23 **
All Discharges		10,057,423	7.5	7.6	0.99 **

* = significant at .05 level

** = significant at .01 level

Source: FY 1984 and FY 1986 MedPAR files; Bureau of Data Management
and Strategy, Analysis by Systemetrics/McGraw Hill

CHAPTER 3

POST-HOSPITAL CARE

The decreased length of hospital stay resulting from PPS is one reason why more Medicare beneficiaries are likely to need post-acute care, such as the services delivered by SNFs, HHAs and swing-bed facilities. This chapter provides information concerning trends in post-hospital care utilization and the availability of post-hospital care providers. In addition, results of econometric studies, which have attempted to isolate the effect of PPS on post-hospital care, are presented. Finally, information is presented that describes the Department's activities regarding quality of post-hospital care and the denial and reconsideration process for HHA and SNF claims. This chapter provides information only on services covered by Medicare, which do not include all types of post-hospital care that beneficiaries may use.

Trends in SNF Utilization

Prior to January 1, 1989, a patient was required to have at least a 3-day inpatient hospital stay prior to receiving Medicare coverage of SNF care. For this reason, changes in SNF utilization are best examined relative to inpatient hospital admissions (or discharges.) Table 3.1 shows that, between 1983 and 1986, the ratio of SNF admissions to inpatient hospital admissions increased from 2.6 percent to 3.4 percent. Preliminary data suggest that the ratio declined in 1987. Hence it appears that SNF utilization increased in the first years of PPS, but has

stabilized or even declined more recently. Similar trends in SNF utilization were found in two HCFA-funded studies.

First, Neu and Harrison (1988) compared a pre-PPS period (calendar year 1981) with a post-PPS period (12 months ending June 1985) and found a national increase in the ratio of SNF to inpatient hospital admissions. The study found only eight States, including three of the four States with waivers from PPS during the study period, in which there occurred a statistically significant decrease in Medicare SNF utilization. These were Hawaii, Kentucky, Maryland, Massachusetts, New Hampshire, New Jersey, Ohio, and Rhode Island. This finding is consistent with the fact that an increase in the supply of nursing home beds, expressed as beds per thousand, occurred in all census divisions for the time period 1981-1987, except the New England and Pacific (Table 3.2).

Second, Abt Associates linked hospital stay records with Medicare SNF care (as well as HHA care) received within 30 days of discharge for a sample of 8,000 hospital discharges per year in PPS States (Gaumer and Gianfrancesco, 1988.) Their results are reported in Table 3.3, which shows that, between 1983 and 1985, the proportion of hospital discharges using SNF care within 30 days increased from 2.9 to 4.0 percent. In 1986, this proportion declined slightly from 4.0 to 3.8 percent.

Another significant finding is that the length of the average SNF stay has fallen sharply during the PPS years. MedPAR data (Table 3.1) show a decline in the number of SNF days per admission from 29 days in 1981 to 21.5 days in 1987. The Abt data (shown in Table 3.3) include only SNF care received within 30 days of discharge in PPS States. They also show a decline, but from a lower base (19.5 days in 1981 to 15 days in 1986). Further, Neu and Harrison found that there was a shift in the distribution in SNF covered days between 1981 and 1984-85, with a larger proportion of

patients using fewer than 20 days of care and a smaller proportion of patients using between 80-100 days of care. This decline in the number of SNF days per admission may indicate that hospitals are substituting SNF care for the last few days of inpatient care, with more short stay patients going to SNFs than previously. In addition, the SNF copayment that applies after 20 days of care has risen steadily since 1981 and may have contributed to the reduction in SNF length of stay. One caveat is in order--the trend in total SNF days received by a patient is unknown because the Medicare data contain information only on covered days.

Trends in the Availability of SNF Services

Consistent with the overall trends in utilization discussed above, the number of Medicare-certified SNFs increased from 5,197 in 1981 to 7,375 in 1987 (Table 3.4). Until 1986, the number of facilities had increased, largely due to application for certification by existing units, rather than by construction of new ones. The largest single year increase occurred in 1986 (7.8 percent) and was due almost equally to conversions and new construction. The increase in the number of Medicare-certified facilities suggests that Medicare beneficiaries probably have had less difficulty in recent years locating geographically accessible facilities where they could receive covered SNF care.

In the past, many SNFs were not capable of providing the type of short-term skilled or rehabilitative care frequently required by Medicare patients. Many SNFs have not found it to their advantage to become certified for Medicare, because of the small number of Medicare patients they expected to serve and the limited number of days that would be covered. PPS appears to have resulted in a greater number of post-acute

SNF patients, covered both by Medicare and by other sources (private pay, Medicaid, other insurance). Therefore, it is possible that SNFs may be responding by changing their staffing and the types of services provided to accommodate patients needing subacute care.

Georgetown University, in a study sponsored by HCFA, is currently conducting a survey of nursing facilities to examine changes in staffing and services offered as a result of PPS. Preliminary results of the study suggest that, in 1985, SNFs offered a wider range of skilled services and employed more nursing staff per bed than they did in 1982.

Trends in Medicare Home Health Utilization

Home health data from the Medicare statistical system show that the number of persons served increased between 1981-1986, although the rate of increase has been slower since the adoption of PPS (Table 3.5). Between 1986 and 1987, there was a 2 percent decline in persons served. The average annual number of visits has been decreasing, from 27 visits per person served in 1983 to 23 visits per person in 1987.

To assess the effect of PPS on home health utilization, it is even more important than it was in the case of SNF care to focus on post-hospital care, since Medicare coverage of home health care is not contingent on a prior hospital stay. For this reason, the Abt data base cited in the SNF utilization section of this chapter is particularly useful. Using these data, Gaumer and Gianfrancesco (1988) estimated that 30 percent of all home health visits occurred within 30 days of hospital discharge and, by 1986, the percentage had increased to almost 40 percent.

The Abt data base also indicates that, for the years 1981 through 1986, the proportion of Medicare beneficiaries using home health services within 30 days of hospital discharge has increased from 6 percent to 14 percent (Table 3.3). Much of the increase is due to initiation of HHA care in the first 7 days after hospital discharge; less change was observed in the remainder of the 30 day post-hospital period. For example, almost 27 percent of persons with a diagnosis of hip replacement (DRG 209) received HHA visits within the first week of discharge in 1986 compared to about 10 percent in 1981. This pattern of change was also found for other selected tracer conditions such as stroke, pneumonia, and hernia repair (Gaumer and Gianfrancesco, 1988).

Within the 30 day post-hospital period, there is an indication that service intensity increased for home health services, with visits per user increasing from 8.5 to 10.5 between 1981 and 1986. This finding does not necessarily conflict with the fact that the annual total number of visits decreased, especially since the latter figure includes some non-hospital related home health. There may be an increase in the number of visits in the immediate 30 day post-hospital period but a decline in the total number of visits overall.

Rand found that there was an increase in the percentage of Medicare patients using home health services in every State during its study period (Neu and Harrison, 1988.) Only in Alaska did Rand fail to demonstrate that the increase was statistically significant.

Trends in the Availability of Home Health Services

The number of Medicare-certified HHAs has grown from 2,858 in 1979 to 5,719 in 1987 (Table 3.6). Nevertheless, the rate of increase has slowed during the PPS years. The greatest percentage increases over this time period were in 1983 and 1984 (17 percent and 23.9 percent, respectively). In 1985 the annual rate of increase was 12.5 percent. In 1986, the rate of increase had fallen to 0.4 percent and, in 1987, the number of HHAs actually decreased 3.9 percent.

The number of hospital-based HHAs increased more than sixfold from 1972 to 1987 (from 231 to 1,456). In particular, there has been a large increase in the number of hospital-based HHAs since PPS started. Hospital-based HHAs increased in 1985, 1986, and 1987 both in absolute magnitude and as a percentage of the total of all HHAs. Conversely, the number of SNF-based HHAs has decreased in the post-PPS period both in absolute numbers and as a percent of the total. Between 1983 and 1987, the number of SNF-based HHAs fell from 136 (3.2 percent of the 1983 total) to 99 (1.7 percent of the 1987 total).

Examination of the data on hospital- and SNF-based home health care is particularly important due to the ready access that these providers have to patients needing HHA care. Operation of an HHA could be particularly advantageous for hospitals that have incentives for decreasing hospital length of stay. Many patients would not qualify for SNF care, so providing HHA care under the hospital's auspices could solve problems relating to discharge planning for needed post-acute care services.

This could be financially beneficial to the hospital as well, since it would receive cost-based Medicare home health payments for these patients. In effect, hospitals could substitute home health services in place of what would otherwise have been the last few days of hospital recovery.

In addition to the changes in the numbers of HHAs since PPS, there have been changes in HHA staffing and the types of services provided. Between 1982 and 1984, the average number of full-time equivalent (FTE) personnel employed by HHAs increased by almost 50 percent, from 19.2 to 29.7. In 1985, however, average FTEs decreased in all categories, with the total average FTEs dropping to 18.7. After dropping to 17.4 in 1986, the number increased to 19 per agency in 1987 and appears to have stabilized at this level.

All HHAs must offer skilled nursing services to their patients in order to be certified by Medicare. Most offer at least one or two other services. Between 1982 and 1987, the proportion of HHAs providing various types of in-home services increased. Nationally, the proportion providing physical, occupational or speech therapy, medical social services, home health aides, interns and residents, nutritional guidance, and pharmaceutical services increased between 1982 and 1987.

PPS Effects on Post-Hospital Care Use

Despite the expectation that post-hospital utilization might rise due to the PPS incentives, the increases in post-hospital care that have occurred since PPS implementation cannot be attributed solely to PPS.

There is no clear means of determining what the level of post-hospital care would have been in the absence of PPS, because other trends were occurring at the same time as PPS or even preceded it. Two econometric analyses have been conducted that attempt to isolate the effect of PPS on post-hospital care use.

A study by Gianfrancesco (1988) investigated both the volume and timing of post-hospital services during the 60 day post-discharge period for four diagnostic groups: stroke, pneumonia, hip replacement, and hernia. Disaggregation of the post-60 day period into shorter periods permitted measurement and analysis of timing as well as volume. The model assumes that each beneficiary's utilization of post-hospital care is a function of PPS' influence on the discharging hospital, geographic factors, hospital characteristics, the seriousness of the beneficiary's condition, other influences on demand, supply constraints, and trend factors. PPS influence was measured in two ways: (1) by the product of the ratio of Medicare discharges to total hospital discharges and a binary variable indicating whether the stay occurred while the hospital was subject to PPS; and (2) by the product of the hospital's measure of expected financial gain or loss under PPS and a binary variable indicating whether the stay occurred while the hospital was subject to PPS.

The results found significant PPS effects for home health and SNF services received within 60 days after hospital discharge. For HHA services, timing was affected, that is, the proportion of visits received in the first 30 days of a total post-discharge period of 60 days increased after PPS. The study found that both timing and volume were affected for

SNF care. Post-hospital levels of care were higher for patients discharged from hospitals that were more susceptible to PPS (as indicated by a higher proportion of Medicare discharges). Post-hospital utilization was also inversely related to the PPS' financial impact on the discharging hospital. Patients discharged from hospitals that were expected to gain under PPS had lower levels of post-hospital services and consumed them less quickly after discharge than patients discharged from hospitals that were expected to lose under PPS (Gaumer and Gianfrancesco, 1988). This could reflect more careful attention to discharge planning by such hospitals.

The second study by Schmitz (1988) looked at HHA and SNF use per capita and post-hospital use within 30 days at the area level for 349 geographic areas for the years 1981-1986. Two measures were constructed of PPS and PPS/Tax Equity Fiscal Responsibility Act (TEFRA) influence on HHA and SNF utilization: (1) a pre/post comparison in nonwaiver States for the years 1981 through 1983 compared to the years 1984 through 1986; and (2) a "double difference" estimate - the difference between the pre/post difference in the nonwaiver States and the pre/post difference in the waiver States. Additional econometric work is being done on a regression model with lagged utilization to examine the relationship between hospital changes in length of stay and HHA and SNF care use (Schmitz, 1988).

Significant PPS effects on SNF care were found in the rural areas. SNF admissions, covered SNF days in the 30 day post-hospital period and the proportion of hospital stays resulting in SNF admissions all rose in 1984. There were small declines in 1985 and 1986, but despite the declines, utilization did not drop to pre-PPS levels. Moreover, such declines were smaller in PPS States than in waiver States. Regression results of the effect of PPS on SNF care in urban areas are more difficult to interpret. SNF use did increase in 1984, but there were large declines in 1985 and 1986, dropping to pre-PPS levels. This rate of decline, however, was also lower in PPS States than in waiver States, so it is possible that PPS slowed the decline.

Attribution of an increase in HHA care to PPS in this study was difficult because the levels of HHA use increased throughout the time period 1981-1986. In urban areas, HHA care was found to grow more slowly in PPS States than in waiver States in 1982, prior to PPS, but more rapidly in 1983 and after, suggesting that PPS had an effect. In rural areas, there was an increase in post-hospital HHA care after PPS compared to pre-PPS. Also, the rate of increase was higher in PPS States than in waiver States. Therefore, the results tend to suggest that PPS had an effect on increasing rates of HHA use in both urban and rural areas.

The inconsistency between the two studies regarding PPS effects on SNF use are probably due to differences in the samples used. Schmitz (1988) included all Medicare cases, while the Gianfrancesco (1988) study examined only a sample of cases from four tracer conditions. A second

difference is that the Gianfrancesco study did not do separate analyses for urban and rural areas, which the Schmitz study did.

In their synthesis on post-hospital care and PPS, Gaumer and Gianfrancesco (1988) conclude that these econometric studies "provide substantial evidence that the utilization of post-hospital care was altered by PPS. There is also evidence that these effects varied considerably among different diagnostic groups and types of post-hospital care. The service most affected seems to have been HHA, though it is unclear whether this effect was mostly on timing rather than volume." Much of the evidence suggests that the increases in use are due more to a shift in the timing of receipt of services, i.e., more services are being received in the first 7 and 30 days of hospital discharge, although total volume may be affected to some extent as well. The overall trends indicate that there may be a leveling off of the increases in HHA and SNF utilization for 1987.

There has been concern that all Medicare beneficiaries may not have equal access to post-hospital care services and that some may, therefore, be disadvantaged by shorter lengths of hospital stay. Differentials do exist between rural and urban areas in use of home health and SNF care and, while increases have occurred in both services over the period 1981-1986, the gap between urban and rural utilization has been shrinking, particularly in the use of SNF services. (See Table 3.7) Beneficiaries who live in rural areas and receive care in urban hospitals are thought to be at a disadvantage in obtaining post-hospital care. Gaumer and

Gianfrancesco found, however, that this group's rates of post-hospital care use did not differ much from those of other groups for several tracer conditions, with the exception of hip replacements. Their use rate for this condition was much lower.

Impact of PPS on Rural Post-hospital Care

As one component of the HCFA-funded evaluation of the National (Rural) Swing-Bed Program, the University of Colorado Health Services Research Center studied the impact of PPS on small rural hospitals (Shaughnessy and Schlenker, 1988). Acute care length of stay, case mix, acute and subsequent Medicare costs, and quality of care were analyzed for hospitals with swing-bed programs compared to those without swing-bed programs, taking into consideration whether the hospitals also have distinct-part long-term care units. This section summarizes the University of Colorado study.

Hospitals with swing-bed programs and/or long-term care units have been thought to be especially susceptible to early acute care discharge, since such hospitals can gain additional Medicare (and possibly other) long-term care revenues through such units. This topic is important in view of the growth in number of swing-bed hospitals (to over 1,000 hospitals by mid-1987) and the expansion of the program (as part of the Omnibus Budget Reconciliation Act of 1987, P.L. 100-203) to include rural hospitals with up to 100 beds (Shaughnessy, Schlenker, and Silverman, 1988). To examine these and related issues, the PPS

component of the National (Rural) Swing-Bed Program Evaluation was designed to address the following major questions as they pertain to small rural hospitals:

1. Has PPS changed Medicare acute care length of stay differently for hospitals with swing-bed programs compared to those without such programs? Are the differences affected by whether or not the hospitals also have separate long-term care units?
2. Have Medicare acute care case mix shifts occurred since the implementation of PPS, and have these shifts been different for swing-bed and nonswing-bed hospitals?
3. Have the post-PPS changes in hospital-level cost and utilization varied by hospital type?
4. Do total Medicare post-discharge costs per patient vary among patients discharged from the different hospital types (including subsequent acute care costs)?

The most important analyses used facility- and patient-level Medicare data for the samples of swing-beds and comparison hospitals from the core (original) component of the National Swing-Bed Program Evaluation. The sample hospitals comprised a representative cross section of swing-bed hospitals and similar hospitals that were eligible for but not participating in the swing-bed program (i.e., comparison hospitals).

Both the swing-bed and the comparison hospitals were further grouped according to whether they had a distinct-part long-term care unit. Since the sample hospitals were either participating in or eligible for the swing-bed program, they were located in rural areas and had fewer than 50 staffed beds.

Data sets used in the study included Medicare claims data for 1982 and 1985, claims data on all patients (non-Medicare as well as Medicare) from the Iowa Hospital Association, Medicare cost reports, and data from the Medicare Automated Data Retrieval Systems (MADRS). In addition, data on PRO acute care denial rates in four States were obtained and analyzed. Limited patient-level analyses were also carried out using data collected for the core component of this study, supplemented by data on additional patients for this component.

The general conclusion of the PPS component of the swing-bed evaluation was that swing-bed care provides a viable additional option for Medicare post-acute care, which at times substitutes for other SNF and home health care and contributes to lower subsequent acute care use and cost. The study, therefore, suggests that swing-bed care is cost effective. The specific findings of the study are summarized below.

Medicare Acute Care Length of Stay. Both swing-bed and comparison hospitals reduced Medicare acute care length of stay between 1982 and 1985. After adjusting for changes in DRG distributions between 1982 and 1985, average acute care lengths of stay dropped from 7.29 days to 5.15 days in swing-bed hospitals, and from 6.67 days to 5.03 days in

comparison hospitals. The reductions in length of stay were greater for swing-bed hospitals, but such hospitals also had longer pre-PPS lengths of stay. By 1985, the two types of hospitals had approximately the same average lengths of stay. The reductions in lengths of stay did not appear to be related to whether a hospital had a distinct-part long-term care unit.

Non-Medicare Acute Care Length of Stay. Based on data for discharges from all payers from a sample of 50 Iowa swing-bed hospitals, acute length of stay was also reduced for non-Medicare patients. The reductions, however, were considerably less and were from a much lower average length of stay in 1982 than was the case for Medicare patients (i.e., from 4.18 days to 3.47 days, adjusting for changes in the DRG distribution). It could not be determined whether these reductions were related to PPS.

Medicare Acute Care Case Mix. As measured by average DRG weight per hospital, Medicare acute care case mix increased for swing-bed and comparison hospitals between 1982 and 1985. The increases were similar for both types of hospitals and were unaffected by whether the hospitals also had distinct-part units. The average DRG weights for the swing-bed and comparison hospitals were essentially the same for both 1982 and 1985.

Hospital Per Patient Day Costs. Changes in per patient day costs differed between swing-bed and comparison hospitals. In 1982, the two hospital types were similar in their overall cost structures. However, by 1985, cost per acute patient day was greater for swing-bed hospitals than for comparison hospitals. This was largely due to the greater decline in acute care occupancy rates among swing-bed hospitals than among the

comparison hospitals. When swing-bed patient days were included in the determination of occupancy rates, the rates were similar for swing-bed and comparison hospitals. Therefore, swing-bed hospitals did not reduce overhead and fixed cost items commensurate with declines in acute care occupancy.

Medicare Cost Per Patient. In terms of total Medicare cost per patient, analyses of the MADRS data indicated that patients discharged from acute care in hospitals with swing-bed programs were more likely to receive swing-bed care than patients discharged from comparison hospitals. Such patients also received less Medicare nursing home (SNF) and home health care. Subsequent acute care use and cost also tended to be lower for patients discharged from acute care in swing-bed hospitals. The overall result was a slightly lower total cost of care (both excluding and including the cost of the initial acute care episode) for patients discharged from acute care in swing-bed hospitals. When individual DRGs were analyzed, only for stroke (DRG 14) were Medicare costs higher for swing-bed compared to comparison hospital discharges. Subsequent patient level analyses, however, found somewhat better long-term care outcomes (measured in terms of improvement in activities of daily living scores) for swing-bed stroke patients.

Patients discharged from acute care in hospitals with distinct-part units were most likely to receive SNF care from nursing homes and less likely to receive home health care than were patients discharged from acute care in hospitals without such units. Patients from hospitals with distinct-part units also tended to have lower costs than did patients

discharged from hospitals without such units.

PRO Denial Rates. Analyses of PRO denial rates for acute care admissions, readmissions, and transfers revealed no major differences between swing-bed and comparison hospitals or between hospitals with distinct-part units compared to those without such units. Overall, no evidence emerged to suggest that swing-bed hospitals inappropriately discharged acute care patients to swing-bed care. The same result was found for (rural) hospitals with distinct-part long-term care units.

Patient Care Outcomes. Analyses of primary patient-level data revealed no major differences in overall long-term care patient outcomes between patients discharged from acute care in swing-bed hospitals relative to comparison hospitals.

Procedures for Assuring Quality of Post-Hospital Care

Section 9305(i) of OBRA 86 requires that each annual report include an evaluation of the adequacy of the procedures for assuring quality of post-hospital services furnished under title XVIII of the Social Security Act. HCFA assures quality of post-hospital care in a number of ways. These include:

- (1) conditions of participation focusing on quality and a survey and certification procedure for long-term care facilities and agencies to assure that these conditions are met;
- (2) provisions specifying activities with respect to aftercare; and
- (3) conditions of participation for hospitals requiring discharge planning.

In the first area, HCFA will be implementing new conditions of participation for nursing home facilities that are designed to improve the quality of care and quality of life in these institutions. These conditions include annual resident assessments, 24-hour nursing coverage, nurses' aide training, and pre-admission screening and resident review for mentally retarded, developmentally disabled, and mentally ill individuals. In addition, significant changes in the survey process were implemented in August 1986 that focus survey efforts on the quality of care furnished to long-term care residents. Specifically, the survey orientation in SNFs and Intermediate Care Facility (ICFs) emphasizes looking firsthand at residents and observing them and the care they are given, rather than concentrating on administrative, procedural, and structural requirements. Furthermore, additional survey revisions will be implemented in October 1990. As of that date, the distinction between SNFs and ICFs under Medicaid will no longer exist; all facilities will be considered nursing facilities.

Quality assurance procedures and efforts are also being strengthened and expanded in the home health survey process. The home health survey process is also being revised as an outcome approach. This process is being developed to evaluate patient outcomes through a patient-centered approach of direct observation. Standardized assessment tools and survey protocols are now being developed and should be completed by the end of 1989.

A second method of quality assurance requires PROs to review at least a sample of readmissions within 31 days to PPS hospitals and the intervening post-hospital care period, including SNF and HHA services. Generic quality screens have been developed for both home health and SNF settings and are used by the PROs to assess quality of post-hospital care. By April 1989, all the PROs will have implemented these generic screens as part of their contracts.

Another method of assuring quality of post-hospital care would require hospitals to have a discharge planning process as a distinct condition of participation for the Medicare and Medicaid programs. The elements of that discharge planning process will also be specified to improve the likelihood that a patient's post-hospital placement will be appropriate. A proposed rule that would implement this requirement was issued in June 1988. In addition, an Advisory Panel established by OBRA 86 is developing (with HCFA staff support) a uniform needs assessment instrument that could potentially be used by hospitals and other providers for evaluating an individual's need for post-hospital extended-care services, home health services, and long-term care services. This instrument will be developed by the end of 1989 and a report to Congress will be submitted with recommendations for the appropriate use of the instrument.

Evaluating the Appropriateness of Post-Hospital Care

Section 9305(i) of OBRA 86 required that each annual report provide information concerning the assessment of problems that have prevented beneficiaries from receiving appropriate post-hospital care. HCFA and

the Assistant Secretary for Planning and Evaluation (ASPE) have undertaken a major study to provide more definitive information on the appropriateness and effectiveness of post-hospital care. Appropriateness and effectiveness will be assessed through the use of professionally developed guidelines of care and health status outcome assessments. The other objective of the study is to determine the nature and extent of problems encountered by patients in obtaining post-hospital care and to assess other factors associated with less than adequate service patterns, including potential barriers to the receipt of needed services (e.g., financial barriers and provider availability), informal caregiver burdens, out-of-pocket costs, discharge planning, and patient satisfaction.

The study comprises two projects: a pilot study and a major national study. The pilot study is developing and field testing methods for determining the appropriateness of post-discharge aftercare services. All types of post-hospital care are being studied, including both skilled and unskilled care. Study methods involve classifying patients at the time of hospital discharge according to their post-discharge service needs and applying professionally developed guidelines to project aftercare needs. Projected need and patient outcomes will then be compared with services received based on interview data. The pilot study is planned for completion in early 1989. The findings of the pilot study will be reviewed to determine the advisability of a national aftercare study.

Another study, which is being conducted by the University of Minnesota with HCFA and ASPE funding, is examining the course and outcomes of post-acute care (including rehabilitation hospital, SNF and home health care). It has two major components:

- (1) analysis of Medicare data to assess differences in patterns of care across the country and to determine the extent of substitution where various forms of post-acute care services are more or less available; and
- (2) detailed examination of clinical cases from the most common DRGs receiving post-acute care in three sites. These DRGs are stroke, chronic obstructive pulmonary disease, congestive heart failure, hip/joint procedures, and hip fractures.

Information is gathered from selected Medicare beneficiaries at four points in time: acute care hospital discharge, and 6 weeks, 6 months, and 1 year following hospitalization. Information is being collected on demographic characteristics, functional status, severity of illness, living arrangements, and utilization and costs of care. Information is also being gathered on the amount and types of care, and resources being provided by the family prior to hospitalization, and at each of the three follow-up periods. Family caregivers are being asked about the burden and stress they have experienced because of the special medical and other needs of their disabled relative. Results of this study are expected in 1990.

Reconsiderations and Appeals for Payment of Post-Hospital Care Services

Section 9305(i) of OBRA 86 required that information be provided concerning reconsiderations and appeals with respect to payment for post-hospital care services. Medicare beneficiaries have a right to have decisions regarding payment of their denied Medicare Part A claims be reconsidered by intermediaries. If dissatisfied with the reconsideration decision, beneficiaries have the option of filing for an informal hearing conducted by an Administrative Law Judge (ALJ). A party to the hearing may request the Appeals Council to review the ALJ's decision, but the Appeals Council is not required to grant this request. HCFA may also informally request the Appeals Council to exercise its discretion to review the ALJ's decision, but is not party to the hearing, unless made a party by the ALJ. Both the hearing and the appeal require that the disputed amount be over \$100, if the denial was made by an intermediary, or \$200, if the denial was made by a PRO. At each level of review, one of five dispositions may occur. The case may be affirmed, dismissed, partially reversed, fully reversed, or withdrawn. A final appeal may be filed with the Federal district court if the amount of dispute is over \$1,000 in the case of an intermediary denial, and \$2,000 in the case of a PRO denial.

In FY 1988, approximately 22 percent of SNF claims were denied, compared to 28.6 percent in FY 1987 (HCFA, 1988.) In FY 1988, there were 16,587 reconsideration requests, which comprised approximately 9.8 percent of denied SNF claims and 2.1 percent of all SNF claims. Including

submissions from the previous year, 18,710 requests were processed, of which 5,996 were reversed in whole or in part. There were 1,231 ALJ cases completed, of which 742 were reversed. During FY 1988, approximately 3.6 percent of HHA claims were denied, compared to 5.7 percent in FY 1987. In FY 1988, there were 43,894 home health care cases submitted for reconsideration, which comprised approximately 17 percent of all HHA denials and 0.6 percent of all HHA claims. Including submissions from the previous year, a total of 60,756 cases were processed, of which 20,208 were reversed. Of 8,971 appeals received in FY 1988, 3,296 were heard with 2,452 reversed partially or fully.

There has been congressional concern about SNF and HHA claim denials. OBRA 86 mandated a report to Congress regarding the frequency of, the reasons for, and the rate of reversals of denials, among other issues. This report is expected to be submitted to Congress shortly. As a result of the Medicare Catastrophic Coverage Act (MCCA) of 1988, Congress also established an Advisory Committee on Home Health Claims that will study the reasons for the increase in the denial of claims for home health services, the ramifications of the increase, and the need to reform the process involved in these denials.

Future Trends Affecting Post-Hospital Care Use

With the adoption of MCCA of 1988 and some other events, there may be increases in post-hospital care utilization. Effective January 1989, Medicare SNF coverage is extended from 100 to 150 days, with coinsurance

much reduced for the first 8 days. Also, the 3 day prior hospitalization requirement and the spell of illness concept have been dropped. In addition, there has already been a clarification of the definition of "skilled" level of care through a HCFA intermediary manual issuance, effective April 1988. Preliminary data suggest that, as a result of this clarification, SNF admissions have increased. The combination of these two changes in the SNF benefit is likely to result in increased use.

Beginning January 1990, daily home health care can be provided for up to 38 consecutive days while previously it was only approved beyond 3 weeks under extraordinary circumstances. Also, the definition of "intermittent" is clarified as fewer than 7 days; previous administrative guidelines defined it as no more than 4 days per week (a recent court decision also set aside the previous administrative guidelines for claims after February 1987). As a result, there are likely to be increases in use of home health services.

References

1. "Posthospital Care and PPS: A Synthesis" - Gary Gaumer and Frank Gianfrancesco - October 19, 1988.
2. "PPS and Geographic Effects on the Utilization of Posthospital Care" - Frank Gianfrancesco - August 31, 1988.
3. "Posthospital Care Before and After the Medicare Prospective Payment System" C.R. Neu and Scott Harrison - March 1988.
4. "Effects of PPS and Per Capita Medicare Utilization: 1981-1986" - Robert Schmitz - November 16, 1988.
5. "Rural Acute and Postacute Care Under Medicare's Prospective Payment System" - Peter Shaughnessy and Robert Schlenker - December 1988.
6. Health Care Financing Administration, "Intermediary Workload and Processing Time Report, Fiscal Year 1988."

Table 3.1 TRENDS IN MEDICARE SNF UTILIZATION, 1980 - 1987

Year	SNF Admissions	Hospital Admissions per 1,000 Enrollees	SNF/Hospital Ratio	Covered Patient Days						Average Days per Admission	Percent Change
				Number (millions)	Percent Change	Per 1,000 Enrollees	Percent Change	Hospital Admissions	Percent Change		
1980	278,849	938	0.0267	8.7	n.a.	308.6	n.a.	0.83	n.a.	29.6	n.a.
1981	273,325	936	0.0252	8.6	-1.1%	300.0	-2.0%	0.79	-4.8%	29.2	-1.4%
1982	n.a.	n.a.	n.a.	8.7	1.2%	299.3	-0.2%	0.77	-2.5%	n.a.	n.a.
1983	308,929	1,131	0.0264	9.1	4.6%	307.3	2.7%	0.78	1.3%	29.2	n.a.
1984	332,746	1,131	0.0290	8.9	-2.2%	295.2	-3.9%	0.78	0.0%	26.6	-8.9%
1985	360,501	1,135	0.0337	8.5	-4.5%	279.0	-5.5%	0.79	1.3%	23.4	-12.0%
1986	347,418	1,131	0.0340	7.7	-9.4%	273.0	-2.2%	0.74	-6.3%	22.4	-4.3%
1987	327,012	n.a.	0.0327	7.0	-9.1%	221.0	-19.0%	0.70	-5.4%	21.5	-4.0%

Notes: Data based on claims processed through December 31, 1987 and include PRS waiver States.

Sources: HCFA, Office of Research and Demonstrations.

Table 3.2

AVAILABILITY OF CERTIFIED NURSING FACILITIES BY STATE AND CENSUS DIVISION
1981, 1985 AND 1987

Census Division / State ^a	Certified ^b Facilities	1981			1985			1987		
		Total Number ^c of Beds	Beds per Thousand Medicare ^d Enrollees	Total Number ^c of Beds						
East South Central: AL KY MS TN	206	20,742	47.5	212	21,555	46.0	212	21,968	45.2	
	204	20,304	49.8	211	21,558	50.3	231	23,397	52.9	
	143	12,294	43.3	153	13,911	46.8	157	14,508	47.6	
	229	24,540	48.0	249	28,087	50.7	279	32,683	56.7	
	Division Total	782	77,880	47.5	825	85,111	48.7	879	92,556	51.1
West South Central: AR LA OK TX	207	19,574	63.8	221	21,381	65.8	247	22,113	66.4	
	225	24,648	63.9	270	29,765	71.9	307	34,980	79.4	
	363	28,330	77.3	367	29,318	76.1	395	32,089	80.9	
	976	100,059	74.4	968	98,592	67.1	1,049	108,965	70.3	
	Division Total	1,771	172,611	71.8	1,826	179,056	69.0	1,998	198,147	72.9
Mountain: AZ CO ID MT NV NM UT WY	25	3,217	10.4	46	6,003	16.2	91	11,288	27.7	
	173	18,936	75.7	180	17,966	64.6	189	18,590	62.7	
	62	4,769	48.8	63	4,832	44.6	66	5,190	45.6	
	94	6,334	72.2	93	6,457	66.8	97	6,572	65.3	
	26	2,269	32.6	29	2,574	28.5	28	2,681	26.0	
	43	3,565	30.1	58	5,449	40.3	66	6,381	43.9	
	80	5,214	46.5	77	5,592	44.1	89	6,957	51.8	
	26	1,904	49.2	28	2,149	51.2	30	2,489	56.6	
	Division Total	529	46,208	42.7	574	51,022	40.9	656	60,148	44.7
	Pacific:	AK	13	644	54.6	12	616	38.8	14	748
	CA	1,184	114,468	47.7	1,198	111,671	42.0	1,237	118,644	42.1
	HI	34	2,516	32.4	34	2,634	27.9	36	2,916	27.9
	OR	178	14,868	48.1	181	15,173	44.1	176	15,002	41.4
	WA	262	24,872	56.7	275	33,123	67.4	284	34,862	66.9
	Division Total	1,671	157,368	48.6	1,700	163,217	45.3	1,747	172,172	45.0

^a United States Postal Service abbreviations are used.^b Facilities certified by Medicare and/or Medicaid to provide SNF and/or ICF services.^c Total beds in certified facilities, including uncertified beds.^d Medicare enrollees include only aged HI and/or SMI enrollees.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 3.2

**AVAILABILITY OF CERTIFIED NURSING FACILITIES BY STATE AND CENSUS DIVISION
1981, 1985 AND 1987**

Census Division / State		a		1981		1985	
United States		Certified b Facilities	Total Number c of Beds	Beds per Thousand Medicare d Enrollees	Total Number c of Beds	Beds per Thousand Medicare d Enrollees	Total Number c of Beds
New England:		13,326	1,362,223	53.4	14,078	1,483,458	53.7
CT	231	24,783	66.8	230	26,582	65.6	243
ME	145	9,140	63.2	144	9,362	61.1	145
MA	513	45,005	62.2	517	46,139	60.5	521
NH	74	6,740	63.7	70	6,794	59.2	74
RI	106	8,545	67.5	109	9,463	69.8	101
VT	44	2,982	50.3	44	3,093	49.2	49
Division Total		1,113	97,195	63.5	1,114	101,433	62.1
Middle Atlantic:		556	68,969	44.7	630	81,624	49.1
PA	233	32,232	37.2	260	37,059	39.5	295
NJ	570	94,124	44.0	595	99,667	45.2	606
Division Total		1,359	195,325	42.9	1,485	218,350	45.4
East North Central:		687	90,107	71.7	700	90,743	68.4
IL	424	41,604	70.5	471	49,076	77.8	545
IN	421	46,275	49.4	426	50,297	49.8	437
MI	856	70,799	59.9	916	81,659	64.2	949
OH	438	53,617	92.8	433	52,616	86.1	427
WI							
Division Total		2,826	302,402	66.5	2,946	324,391	66.9
West North Central:		427	34,118	87.1	444	35,816	88.3
IA	368	25,694	83.6	375	26,161	81.7	398
KS	454	46,335	95.0	468	49,094	95.6	460
MN	237	26,243	40.7	325	36,189	54.1	419
MO	217	17,425	84.1	215	17,799	83.6	226
NE	83	6,570	79.3	82	6,843	78.7	82
ND	114	7,880	84.9	115	8,165	84.4	113
SD							
Division Total		1,900	164,265	74.2	2,024	180,067	78.1
South Atlantic:		26	2,789	45.9	34	3,823	55.4
DE	6	1,166	16.6	12	2,713	37.9	14
DC		34,705	21.3	401	47,680	25.7	489
FL	306	30,649	59.9	319	32,971	58.2	322
GA	301	20,909	53.5	192	23,597	53.9	200
MD	174	21,722	35.8	225	23,497	34.4	259
NC	202	10,880	37.8	132	13,294	40.4	137
SC	123	20,428	40.6	178	25,257	44.8	200
VA	163	5,721	24.3	91	7,979	32.0	117
WV	74						
Division Total		1,375	148,969	34.7	1,584	180,811	37.5

TABLE 3.3
Percent of Discharges Using Services Post 30 Days

	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>
HHA	0.063	0.082	0.094	0.121	0.133	0.143
SNF	0.026	0.021	0.029	0.034	0.040	0.038

Source: Gaumer and Gianfrancesco, 1988.

Table 3.4

CHANGE IN NUMBER OF MEDICARE CERTIFIED SNFs
1981-1987

	(1) Medicare Certified Facilities	(2) Annual Percent Change
May 1981	5,197	---
May 1984	5,908	4.4%
Dec 1985	6,423	5.5%
Nov 1986	6,972	7.8%
Dec 1987	7,375	5.3%

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 3.5

TRENDS IN UTILIZATION OF MEDICARE HOME HEALTH AGENCY SERVICES -- PERSONS SERVED AND HOME HEALTH VISITS

Year	Number (000)	Persons Served			Home Health Visits					
		Percent Change	Per 1000 Enrollees	Percent Change	Number (000)	Percent Change	Per Person Served	Percent Change	Per 1000 Enrollees	Percent Change
1980	957.4	--	34	--	22,428	--	23	--	788	--
1982	1,171.9	22.4%	40	17.6%	30,787	37.3%	26	13.0%	1,044	32.5%
1983	1,351.2	15.3%	45	12.5%	36,844	19.7%	27	3.8%	1,227	17.5%
1984	1,515.9	12.2%	50	11.1%	40,337	9.5%	27	0.0%	1,324	7.9%
1985	1,588.6	4.8%	51	2.0%	39,742	-1.5%	25	-7.4%	1,279	-3.4%
1986	1,600.2	0.7%	50	-2.0%	38,359	-3.5%	24	-4.0%	1,208	-5.6%
1987	1,564.5	-2.2%	48	-4.0%	36,088	-5.9%	23	-4.2%	1,113	-7.9%

Source: HCFA Office of Research and Demonstrations.

Notes: Data are based on claims processed through December 31, 1987 and include FFS waiver States.
1981 data are not available.

Table 3.6

GROWTH IN THE NUMBER OF MEDICARE CERTIFIED HHAs
 Selected Years: 1972-1987

Year	Medicare Certified HHAs	Percent Change ^a
1972	2,212	---
1977	2,496	+2.6%
1979	2,858	+7.3
1982	3,639	+9.1
1983	4,258	+17.0
1984	5,274	+23.9
1985	5,932	+12.5
1986	5,953	+0.4
1987	5,719	-3.9

^a Compounded annual percent change from previous data shown.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 3.7

Percent Receiving HHA or SNF Services
Within 7 Days of Discharge

	<u>Beneficiary Location/Hospital Location</u>		
	<u>Rural/Rural</u>	<u>Urban/Urban</u>	<u>Rural/Urban</u>
<u>Stroke</u>			
1981	12.2	24.2	17.8
1986	27.4	29.1	24.9
Increase	125%	20%	41%
<u>Hip (Arth)</u>			
1981	12.2	18.5	11.5
1986	36.9	39.6	26.1
Increase	202%	114%	127%
<u>Hip (Fx)</u>			
1981	22.0	43.3	35.2
1986	46.8	56.2	49.8
Increase	113%	30%	41%
<u>Pneumonia (89,90)</u>			
1981	5.1	8.0	5.3
1986	11.8	16.3	12.6
Increase	131%	104%	138%

Source: Gaumer and Gianfrancesco, 1988.

Chapter 4

IMPACT ON HOSPITALS

The 1986 Impact Report concluded that PPS appeared to be affecting the way that hospitals operate. Most notably, inpatient length of stay declined and the rate of increase in hospital costs slowed. Practice patterns also appeared to be changing, as exemplified by the rapid rates of increase in outpatient and other ambulatory services and the expansion of post-acute care. This chapter updates data concerning these trends and evaluates them from the perspective of an additional year's data and experience beyond the material available for last year's report. Most of the chapter is devoted to providers of inpatient hospital care, but the chapter also contains material on outpatient care.

This chapter begins with a brief description and comparison of the experience of hospitals in FY 1987, overall and under PPS. Following a summary of trends for the industry as a whole, the experience of various groups of hospitals is examined. Due to the extensive treatment of historical trends in the 1986 Impact Report, the presentation here is less detailed. This year's report highlights industry-wide and PPS trends in expenses, revenues, and margins. Special attention is given to the rate of increase in inpatient costs per case and the PPS performance of specific types of hospitals (most notably, large teaching hospitals and rural hospitals). In addition, separate sections are devoted to specific topics where HCFA-funded and other research has been completed since the 1986 Impact Report was prepared.

These topics include: hospitals' responses to fiscal pressure, hospital closures and other organizational changes, trends in capital expenditures, and innovation and diffusion of new technology.

Long-Run Industry Trends in Expenses, Revenues, and Margins

Data from the AHA National Hospital Panel Survey indicate that, between 1970 and 1983, inpatient hospital expenses and revenue per case generally grew at about the same rate. Real expenses (adjusted for inflation) per case rose at an annual average rate of 3.4 percent, compared to 3.7 percent for real revenue per case. The similarity of these rates is not surprising given the dominant role of cost-based reimbursement during this period and the largely nonprofit orientation of the industry.

However, since PPS, several notable changes have occurred. First, in 1984, the rate of increase in real expenses per case dropped well below its historical average for the pre-PPS period (1.7 percent versus 3.4 percent). Second, in 1984, although the real rate of increase in revenue per case was also well below its longer run average (2.8 percent versus 3.7 percent), the difference between the two rates widened dramatically (2.8 percent versus 1.7 percent.) Third, between 1985 and 1987 real expenses per case rose more rapidly than their long run average (3.9 percent versus 3.4 percent.) Fourth, between 1985 and 1987 real revenue per case rose somewhat less rapidly than its long run average (3.4 percent versus 3.7 percent) and noticeably less rapidly than real expenses per case (3.4 percent versus 3.9 percent.)

These shifts in trends have several implications. Since revenues grew somewhat more rapidly than expenses over the period 1970-1983, margins (the difference between revenues and expenses) increased. Margins peaked in 1984 but have subsequently declined, since between 1985 and 1987 revenues grew somewhat less rapidly than expenses. The AHA reports total margins (revenue from all sources minus total expenses, expressed as a percent of revenue) and patient margins (patient revenue minus total expenses, expressed as a percent of patient revenue.) In 1987, the total margin was 4.7 percent compared to 6.2 percent in 1984. Similarly, in 1987, the patient margin was 0.1 percent, compared to its historical high of 2.0 percent in 1984.

It should be noted that the 4.7 percent margin for 1987 is greater than it was in any year during the 1970's. Further, in the 1970's, AHA patient margins were negative.

AHA patient margins are difficult to interpret for at least two reasons. They may be very misleading if there are significant nonpatient expenses as well as nonpatient revenues. Also, patient care subsidies received by public hospitals from Government sources are often classified as nonpatient revenue.

Trends in PPS Costs, Revenues, and Operating Margins

The AHA data provide a picture of hospitals' overall financial performance, but do not indicate whether PPS payments are sufficient to pay the costs that PPS was designed to cover. To address this question, it is necessary to separate Medicare revenues and costs from those of other payers. Further, PPS operating payments and costs must be separated from payments and costs for capital, direct medical education, and certain other items (e.g., kidney acquisition).

Table 4.1 compares PPS operating margins (PPS payments minus operating costs divided by PPS payments) with total margins for all payers for the period from 1984 to 1987. Total margins derived from Medicare cost reports are compared with AHA total margins. Although these two sets of total margins may differ for a variety of reasons (time periods covered and numbers of hospitals differ and costs and revenues may not be measured identically), they both show a consistent downward trend since 1984. Both sets of total margins are lower in each year than the PPS operating margins, at least in part because of uncompensated care's effect on the total margins. PPS and total margins have declined over this period, but PPS revenues have been consistently greater than the costs that PPS was designed to cover.

The change in the PPS operating margins can be explained by changes in PPS payments and Medicare operating costs per case. PPS margins rose dramatically compared to the TEFRA year, due largely to a 16 percent increase in revenues and a significant drop in the rate of increase of Medicare costs in the first year of PPS. However, in the following three years, Medicare operating costs per case (not adjusted for inflation) have risen 9 to 10 percent per year. The rate of increase in PPS payments per case (not adjusted for inflation) has declined from about 10 to 4 percent over these 3 years. As a result, Medicare operating margins have declined as shown in Table 4.2.

The rate of increase in PPS payments per case is largely determined by the size of the annual update factor and changes in the CMI. Both factors have contributed to the decline in the rate of increase in PPS payments during this period. By law, the rates were adjusted in FY 1984 and FY 1985 so that total payments under PPS equalled the estimated payments that

would have been made under TEFRA. Under Public Law 99-107 (the Emergency Extension Act of 1985), the rates were frozen at FY 1985 levels from the beginning of FY 1986 until May 1986. Under COBRA, they were increased by 0.5 percent for the remainder of FY 1986. Under Public Law 99-177 (Increasing the Statutory Limit on the Public Debt, 1985), payments were also subject to a 1 percent reduction from March 1986 through the remainder of FY 1986. OBRA 86 increased the FY 1987 rates by 1.15 percent.

The CMI contributed to the large increase in revenues in the first PPS year and has generally added 2 to 4 percentage points to revenue growth in the succeeding years. The FY 1984 index was approximately 9.5 percent higher than the 1981 CMI used to initially calibrate the system. However, slightly over 3 percent of this increase was anticipated (due to data quality and coding improvement) and offset through an explicit adjustment to remove factors such as those that are not indicative of "real" case mix change. In the next 3 years, increases of 4.3, 2.8, and 2.4 percent occurred. Data on variation in case mix change appear in Table 4.3.

Significant cost reductions occurred during the first PPS year. The combination of a hospital marketbasket increase of 4.9 percent for that year plus a 5.2 percent decline in discharges could have possibly led to as much as a 10.1 percent increase in Medicare operating cost per case.* Instead,

*Declining discharges (admissions) create the potential for cost reductions, but will increase cost per case if cost reductions are either not made or lag behind discharge declines. If discharges decline 5.2 percent and corresponding cost reductions are not made in that time period, then cost per case would rise approximately 5.2 percent. Of course, the assumption that no cost reductions accompany discharge declines simplistically treats all costs as fixed. The assumption is used in the discussion as a way of gauging the possible roles of various factors that affect cost per case. It should also be noted that while the causes of admission declines since PPS are not fully understood, there is evidence that increased stringency of PRO review was an important factor that happened to coincide with the implementation of PPS. Admission declines do not appear to have been attributable to PPS. Indeed, as discussed in previous reports, PPS provides a financial incentive to increase admissions.

Medicare operating cost per case rose only 1.7 percent in the first PPS year. The well-documented pattern of declines in length of stay, reductions in employment, and shifts of care to the ambulatory and post-acute settings appear to be responsible for this result. In the second PPS year, the marketbasket rose about 4.0 percent and discharges declined another 6.1 percent. Together these factors could possibly have led to as much as an 10.1 percent increase in Medicare operating cost per case. The Medicare CMI rose 4.3 percent, although how much of this increase represented increased patient resource requirements (and hence higher costs) is not clear. Nevertheless, Medicare operating cost per case rose 9 percent, which implies that savings may have been achieved in the second year.

In the third and fourth PPS years, no additional cost savings appear to have been achieved. Medicare operating cost per case continued to increase about 9 percent each year, although input prices increased less rapidly (3.0 and 3.5 percent) and discharges fell less rapidly (3.6 percent and 1.1 percent). These factors could account for no more than 6.5 and 4.6 percentage points of each year's increase. Case mix increases, although lower than in the FY 1985 (2.8 and 2.4 versus 4.3 percent) may have contributed more to cost pressures than in previous years. Recent work at the Rand Corporation (Carter, 1989) suggests that about two-thirds (1.6 percentage points of the 2.4 percent) of the increase in the CMI between FY 1986 and FY 1987 was "real," that is, related to increased patient resource requirements.

The Rand estimate was obtained after accounting for the effects of changes in the DRG classifications (7 percent) and changes in coding standards and procedures (26 percent). One caveat regarding these

results is that Rand was unable to look beyond the information recorded in the medical record to determine whether medical record practices might also be a source of increase in the CMI. (If hospitals record more complete information in the medical record over time, the CMI will tend to increase. Such increases will not be identified as due to coding changes.)

Changes in hospital behavior may also have played a role in the high rates of increase in the third and fourth PPS years. The hypothesis (as described by the Prospective Payment Assessment Commission (ProPAC), (1988) is that:

"During the early years of PPS, hospitals overall were in a strong financial position, partly because they held down costs during the first year. As a result, pressure imposed by PPS for further cost reductions may have lessened. Although hospitals can always increase margins by reducing costs under PPS, they may make trade-offs between maximizing margins and other goals associated with providing the most up-to-date medical care. In particular, hospitals may not have continued pressuring their medical staffs to eliminate using services of questionable value. They may also have been more receptive to medical staff requests to add new diagnostic and therapeutic capabilities."

Later in this chapter, some empirical tests of this hypothesis are discussed (Hospital Responses to Fiscal Pressure). The research (Hadley et al.) lends some support to the hypothesis, but since it is based primarily on cross-sectional comparisons of hospitals under greater or lesser financial pressure, it may not explain the time series changes in aggregate costs per case described above. Also there is a discussion of research on trends in capital expenditures and the impact of PPS on the diffusion of new

medical technology. The results of this research are generally consistent with the view expressed above by ProPAC. Expenditures for movable equipment appear to be expanding rapidly, and PPS appears to have had no discernible dampening effect on the spread of new technology.

Variation in PPS Experience of Different Hospital Groups

The aggregate trends described in the preceding sections mask considerable variation in the PPS experience of different groups of hospitals. The variation in PPS operating margins was described in the 1986 Impact Report and is updated here with data for the third and fourth PPS years. Overall the story is a familiar one. The median Medicare operating margin (50th percentile) and the percent of hospitals with positive margins declined sharply from PPS-1 to PPS-3 as shown in Table 4.4.

Table 4.4 also shows that there has been wide variation in hospital performance under PPS through PPS-4. Hospitals in the 90th percentile have had very high margins through every year of PPS. In contrast, the margins of hospitals in the 10th percentile have declined sharply during this period.

Virtually without exception, the groups displayed in Tables 4.5 and 4.6 followed the pattern of all hospitals: All saw their PPS margins decline in years 3 and 4 compared with years 1 and 2. Other familiar urban-rural and hospital size patterns also appear. Some caution should be applied in interpreting Table 4.5 because the PPS-4 data are available for only about 60 percent of the hospitals. To address the potential effects of varying numbers of hospitals over time, Table 4.5 contains the maximum number of hospitals for which data are available in each year. Massachusetts and New York hospitals first appear in the PPS-3 year. Table 4.6 presents the

same information for the 3,225 hospitals for whom cost report data are available from the TEFRA year through the PPS-4 year. Since they were excluded from PPS until FY 1986, Table 4.6 contains no hospitals in Massachusetts and New York.

The discussion that follows highlights the experience of three groups of hospitals, beginning with major teaching hospitals, most of which are urban. Then urban teaching and disproportionate share hospitals (DSHs) are discussed. Disproportionate share payments were introduced in May 1986, and FY 1987 (roughly equivalent to PPS-4) is the first full year of disproportionate share payments. Finally, the situation of rural hospitals is reviewed in some detail.

Major Teaching Hospitals

This group of hospitals (teaching hospitals with resident-to-bed ratios greater than .25) have consistently displayed higher PPS margins than any other group identified in Tables 4.5 and 4.6. They also have proved much more resistant to declines in PPS margins than other hospital groups even though indirect medical education (IME) payments were reduced in 1986 (see the discussion in the section that follows). Their margins declined from the 18-20 percent range from PPS-1 to PPS-3 to about 12-14 percent in PPS-4. Several factors may have played a role, including below average rates of increase in operating cost per case, higher than average case mix increases (see Table 4.3), and the fact that about one-half of the major teaching hospitals are also DSHs.

Urban Teaching and DSHs

In COBRA, Congress reduced IME payments and introduced "disproportionate share" payments, in an attempt to provide additional compensation to hospitals that serve a relatively large number of low income patients. The measure of disproportionate share adopted was a combination of two proxy measures for a hospital's low income patient load: the proportion of a hospital's Medicare days provided to beneficiaries eligible for Supplemental Security Income, and the proportion of a hospital's total days provided to Medicaid recipients. COBRA also contained system savings and budget neutrality conditions related to the IME and DSH provisions, though they have no direct bearing on the current discussion.

Tables 4.5 and 4.6 contain information about the effects of these COBRA provisions on PPS operating margins, classifying hospitals according to whether they receive one or the other, both, or neither IME nor DSH payments. As expected, the tables indicate that in PPS-1 and PPS-2 teaching hospitals had higher PPS margins than did nonteaching hospitals. Little difference is evident between the hospitals that would later receive DSH payments and those that would not. Then in PPS-3 and even more in PPS-4 the effect of DSH payments becomes evident as the differences between the margins of DSH and non-DSH hospitals widen. In PPS-4, the spread between the margins of hospitals receiving neither IME nor DSH payments and those receiving both IME and DSH payments is from about 1 percent for the former to between 9 and 11 percent for the latter. Among teaching hospitals, the difference between hospitals with and without DSH payments is about 3-4 percentage points (about 6-7 percent versus 9-11 percent). Among nonteaching hospitals, the spread is

from about 1 percent for non-DSH hospitals to slightly more than 5 percent for DSH hospitals.

The DSH adjustment was founded on the assumption, and some empirical evidence, that urban DSH hospitals had higher Medicare operating cost per case than non-DSH hospitals. The underlying logic was that low-income patients have above average resource requirements that, under Medicare cost accounting rules, tend to increase the Medicare operating cost per case. The margins discussed here indicate that, on average, DSHs are being compensated in excess of any effect that disproportionate share payments may have on their Medicare operating costs. Further, they are being compensated relatively generously compared to non-DSHs.

Rural Hospitals

Tables 4.5 and 4.6 repeat familiar information about the relative PPS margins of urban and rural hospitals. From the outset, urban PPS margins were about double those of rural hospitals and, through PPS-4, a significant differential persisted. For the cohort of hospitals included in Table 4.6, Table 4.7 presents percentage changes in PPS payments per case, Medicare operating cost per case, and key variables that affect payments and/or costs in an effort to shed more light on the PPS experience of rural hospitals.

A comparison of the rates of increase in PPS payments per case and Medicare operating cost per case shows that the initial difference in margins resulted from the fact that urban hospitals experienced twice as rapid an increase in PPS payments, compared to their TEFRA year, as did rural hospitals (17.6 percent versus 8.7 percent.) The first year rates of increase in cost per case were essentially the same (1.5 percent.)

The differential increase in PPS payments can be accounted for by the difference between the urban and rural standard payment amounts and differential case mix growth between urban and rural hospitals. PPS payments per case rose more rapidly for urban than for rural hospitals until PPS-4, when, under COBRA, the method of financing outlier payments was changed. This change reduced the urban-rural difference in standard payment amounts and resulted in a relative gain in rural payments per case of about 1.7 percentage points. Prior to FY 1987, both rural and urban rates were reduced by approximately 5 percent to fund outlier payments. Since urban hospitals were expected to receive more than 5 percent in outlier payments, compared to only 2-3 percent for rural hospitals, rural hospitals were clearly disadvantaged by this method of financing outlier payments.

Case mix growth also contributed to the more rapid growth of urban

payments per case. The CMI has consistently risen more rapidly for urban than for rural hospitals during the PPS years. In PPS-1, the CMI was already 13 percent higher for urban than for rural hospitals. Cumulatively, by PPS-4, the CMI of urban hospitals had risen 8.7 percent versus 6.1 percent for the CMI of rural hospitals. As a result of all changes affecting payments, between the TEFRA and the PPS-4 years, PPS operating revenue per case rose about 9 percentage points faster for urban than for rural hospitals (37.3 versus 28.4 percent.) However, as Table 4.7 indicates, virtually all of this difference occurred in the PPS-1 year.

On the cost side, over the 4 PPS years Medicare operating cost per case rose less rapidly for rural hospitals than for urban hospitals (31.7 percent versus 33.5 percent.) This occurred despite the fact that Medicare discharges declined much more rapidly for rural than for urban hospitals.* In each year, the decline for rural hospitals was substantially greater than for urban hospitals. Further, rural hospitals made greater reductions in length of stay in the first 2 PPS years. For the cohort of hospitals in Table 4.7, length of stay changed very little for either urban or rural hospitals in PPS-3 or PPS-4. These facts suggest that rural hospitals achieved greater cost restraint during this period than did urban hospitals. The "fiscal pressure" hypothesis cited above (and discussed further below) is consistent with this finding.

Concern about urban-rural differentials in PPS has existed from the outset. In the original PPS legislation, Congress mandated the Department to

*Of course, had rural hospitals experienced less rapid declines in discharges, their rate of increase in Medicare operating cost per discharge might have been lower than it was. In turn, their margins would have been higher and the difference between the margins of urban and rural hospitals would have been smaller.

study the separate urban and rural payment rates and related issues. Subsequent legislation added to the list of reports required on urban-rural issues. The Department addressed all these issues in the 1987 Report to Congress, "Studies of Urban-Rural and Related Geographical Adjustments in the Medicare Prospective Payment System." The report's conclusion, that the changes made to the PPS payment structure since 1987 have essentially removed systematic biases against rural hospitals as a group, is still valid. These changes consist primarily of the establishment of separate urban-rural outlier offsets, case weighted payment rates, completion of the transition to national rates, and differential update factors. Furthermore, HCFA has made the qualifying criteria and payment methods for sole community hospitals more liberal. The Department will also submit to Congress a legislative proposal for the elimination of separate standardized payment amounts for urban and rural hospitals as mandated by P.L. 101-239 (OBRA 1989).

However, there is considerable evidence indicating that changes in the PPS payment formula will not solve the problems of many rural hospitals. HCFA-funded research (Hendricks et al., 1988) suggests that today's problems of rural hospitals are not new. Declining occupancy rates and reduced patient revenues, constrained resources for capital financing, rapid technological change and increasingly complex medical services, and shortages of health professionals all have been pointed to as reasons for the problems of rural hospitals since the 1970's.

Hendricks et al. concluded that, under PPS, inpatient utilization trends have played a major role in determining the performance of both urban and rural hospitals. Not surprisingly, hospitals experiencing large declines in discharges between 1983 and 1986 are in relatively poor financial condition, regardless of the measure of profitability chosen (Medicare margin, total operating margin, or total margin).

Volume declines pose a larger problem for rural than for urban hospitals. According to Hendricks et al., 54 percent of the rural hospitals they

analyzed had discharge declines in excess of 20 percent from 1983 to 1986, compared to 37 percent of the urban hospitals. Over the same period, rural occupancy rates fell from an average of 54 percent to less than 40 percent.

Hendricks et al. also found that increases in total cost per discharge were strongly related to discharge declines. Hospitals with discharge declines in excess of 40 percent experienced a 3-year rate of increase in cost per discharge of 95 percent, compared to less than 3 percent for hospitals whose discharges increased by more than 20 percent.

Hospitals with occupancy rates below 25 percent in 1983 saw total cost per discharge rise almost 80 percent over the 3-year period, compared to less than 30 percent for hospitals with occupancy rates over 65 percent.

Hendricks et al. made preliminary estimates attributing 60 to 70 percent of the overall increase in rural hospitals' total cost per discharge to the decline in occupancy rates. Discharge declines also appear to have contributed directly to hospital closures in the post-PPS period. Further discussion of hospital closures is found later in this chapter.

The Department recognizes that rural hospitals must remain capable of providing high quality health care to Medicare beneficiaries. As authorized by P.L. 100-203, HCFA has made grants available under the Rural Health Care Transition Grants Program. This grant program is intended to assist small, rural, nonprofit hospitals. Funding under the grant program will support participating hospitals in planning and implementing projects to assist the hospitals in adapting to significant changes in their operating environments. These may include changes in the demand for different types of services, changes in populations served by the hospitals, or changes in the hospitals' ability to provide appropriate staffing.

As a subsequent part of the same HCFA project, CHPS conducted a followup study in which it analyzed two cohorts of hospitals: hospitals entering their first PPS year in FY 1985 and hospitals in their second PPS year in FY 1985. Consistent with its earlier findings, CHPS found that, within each cohort, hospitals under the most fiscal pressure constrained costs per case and length of stay the most (Hadley et al., 1988). Further, hospitals in their second PPS year that experienced an increase in fiscal pressure in FY 1985 controlled costs and length of stay more than hospitals in the same cohort that experienced a decline in fiscal pressure.

Hospitals in their second PPS year did not control costs and length of stay as much as they had in the previous year. One explanation may be that the overall decline in fiscal pressure between FY 1984 and FY 1985 that resulted from the high first year PPS margins contributed to the jump in the rate of increase in Medicare operating cost per case in 1985 (Table 4.2).

Abt Associates, also with HCFA funding, conducted a pair of closely related studies. The first of these studies was patterned on the first year CHPS study, but was based on Medicare cost report data rather than AHA data (Merrill, 1988). Hospitals' experiences in their first PPS year were compared without regard to the Federal fiscal year in which they occurred. The results were similar to those of the CHPS study: Hospitals under greater

fiscal pressure in their first PPS year constrained their costs more than did hospitals under less fiscal pressure. The studies disagree in their interpretation of the behavior of hospitals under the least fiscal pressure. Feder et al. concluded that these hospitals did not exhibit significant cost restraint in going from TEFRA to PPS. Merrill argues that there was a restraining effect of PPS for these hospitals.

The second Abt study examined hospitals' responses to fiscal pressure from their TEFRA year through their third PPS year using a combination of Medicare cost report and AHA data (Mennemeyer, 1988). In addition to having 1 more year of data than the other studies, this study adopted a longer run approach to fiscal pressure. Fiscal pressure was measured in terms of the expected effect of PPS once national payment rates were fully phased in. Consistent with the other studies, Mennemeyer found that, over the first 3 PPS years, hospitals achieved greater reductions in length of stay and lower rates of increase in cost per case the greater the fiscal pressure they were expected to experience over the period. In contrast to Hadley et al., Mennemeyer does not attempt to relate changes in fiscal pressure to changes

in the rate of increase in cost per case over the 3 year period. This difference probably is a reflection of their different perspectives on fiscal pressure. Whereas Hadley et al. measured fiscal pressure annually, Mennemeyer used the same long run measure for the entire 3 year period.

In summary, all of these studies provide support for the hypothesis that, cross-sectionally, fiscal pressure exerts a cost constraining effect on hospital behavior. However, only Hadley et al. attempt to draw conclusions about the effects of changes in fiscal pressure on hospital behavior over time. Their time series results are suggestive, but hardly conclusive. The chief concern is whether the measure of fiscal pressure is picking up the effect of other factors that may overstate the extent of hospitals' responses to fiscal pressure. Transitory unanticipated fluctuations in discharges could produce such an effect because of their potential impact on the key variables: costs per case, margins, and length of stay.* Further research is needed to clarify the extent to which fiscal pressure affects hospital behavior.

*An unanticipated decline in a hospital's discharges will increase (decrease) the probability that a hospital is classified as being under great (little) fiscal pressure: such a decline will increase (ease) upward pressure on the hospital's cost per case and tend to decrease (improve) its margin. Length of stay is also likely to be affected by these fluctuations in discharges, rising when discharges fall and falling when discharges increase. The result is that the group of hospitals measured as being under great (little) fiscal pressure will include hospitals that, in the year fiscal pressure was measured, experienced transitory, unanticipated discharge declines (increases). Their inclusion will tend to raise (reduce) the group's length of stay and costs per case. If in the following year, discharges return to more normal levels, the response variables (length of stay and cost per case) will tend to change in accord with the fiscal pressure hypothesis solely because of the change in discharges. The hospitals that were classified as being under fiscal pressure because of their unanticipated decline in discharges are likely to experience a decline in length of stay and a lower rate of increase in cost per case. Accordingly, the hospitals that were classified as being under little fiscal pressure because of their unanticipated increase in discharges are likely to experience an increase in length of stay and a higher rate of increase in cost per case.

Changes In Hospital Organization And Management Strategies

The changes in utilization and financial status described earlier occurred within the context of several other changes in management practices and strategies, some of which are linked to PPS incentives. In contrast with the global review of changes in management practices in last year's report, this section will review changes in hospital employment, growth of multihospital systems (MHS), and hospital status changes.

Hospital Employment

One of the most rapid adjustments by hospitals in response to PPS was to sharply cut employment, decrease wages, and enrich the skill mix of the hospital labor force. AHA Panel Survey data show that FTE hospital employment increased 0.3 percent in 1986 and 0.7 percent in 1987. However, employment growth has been centered in outpatient care units as inpatient employment declined 1.4 percent in 1986 and 0.7 percent in 1987. Full time personnel have only increased 0.3 percent in 1986 and 0.4 percent in 1987 while part-time personnel have increased 0.7 percent in 1986 and 2.3 percent in 1987 (ProPAC, 1988).

Hospitals have increased the proportion of Registered Nurses (RNs) on staff during PPS, despite decreasing hospital utilization during this period. RNs have not only replaced less skilled licensed practical nurses and ancillary nursing staff, but have also replaced other specialized professional and non professional staff (DHHS, 1988).

As The Secretary's Commission on Nursing (DHHS, 1988) noted, the percent of RN vacancies increased from 4.4 percent in 1983 to 11.3 percent in 1987. Although there is a shortage of new RNs graduating from nursing schools, 25,000 new RNs were added to the hospital labor force in 1986. Clearly the demand for RNs has greatly outpaced supply.

Labor expenses, average salary and benefits per FTE all declined sharply during the initial years of PPS but have all increased in 1987. This is partially due to the shift to a more skilled labor force.

MHSs

Membership in MHSs potentially offers hospitals improved access to capital, economies of scale, the ability to diversify, improved personnel management, and better planning due to greater environmental stability and control (Ermann and Gabel, 1984). Because many of these benefits would facilitate economical management under PPS, Health Economics Research (HER) under contract to HCFA examined the effects of MHS membership during PPS (Hendricks et al., 1988a).

The HER study found that MHS membership increased modestly from 33 percent of short term hospitals in 1982 to 40 percent in 1986. The demographics of MHS hospitals changed little during PPS. One-half of MHS hospitals were located in the South. Urban, proprietary, religious, and teaching hospitals were more likely to be MHS members. During PPS, MHS membership increased slightly among rural and Government hospitals. Proprietary chains comprised only 34 percent of MHS members in 1982 and only 31 percent in 1986. Many MHSs were nonprofit and locally-based (Hendricks et al., 1988a).

MHS members appear to have responded more strongly to PPS incentives than nonmembers. MHS members reduced beds by 12.7 percent, admissions by 20.2 percent and length of stay by 9.4 percent from TEFRA to PPS-3 compared to 8.7 percent, 12.5 percent and 6.3 percent, respectively, for nonmembers. MHS members may have had more flexibility in decreasing volume since their facilities were larger in both years. The percentage of Medicare admissions was similar in MHS member and nonmember hospitals and declined only slightly

during PPS.

Pre-PPS comparisons of MHS member and nonmember costs per case found higher costs in MHS hospitals (Coyne, 1982; Levitz and Brooke, 1985). Hendricks et al., (1988a) found that Medicare cost per case was 18 percent higher in MHS hospitals in TEFRA and 12 percent higher in PPS3. These cost differences may be due to provision of more intense care in MHS hospitals (Ermann and Gabel, 1984). The decline in differences during PPS suggests convergence to a national average cost per case, and that membership in an MHS may have been characteristic either of expensive hospitals and/or of a need to reduce costs.

Medicare cost per case in MHS hospitals increased only 17 percent from TEFRA to PPS-3 compared to 23 percent for nonmembers. This was not due to case mix differences since the Medicare CMI was the same for MHS and non-MHS hospitals in both TEFRA and PPS3.

Changes in Hospital Status

HCFA-funded research by HER examined hospitals that changed their acute care status during the 1980s (Hendricks et al., 1988). Of the various types of changes, hospital closures have attracted the most attention because of the potential consequences for access to acute care, especially in rural areas. In addition to closures, the HER report included hospitals that opened, merged with other acute care facilities, split into two or more acute care hospitals, became nonacute care facilities, or changed from nonacute to acute care status.

Data on status changes were obtained from the AHA from a file abstracted from the AHA Annual Survey. HER performed independent verification of some status changes by contacting State licensing agencies. These data were also compared with similar data on status changes maintained by Abt Associates,

Inc. (also obtained from the AHA) and found to be similar. Hendricks et al. determined that the HER data were similar to data for the same period previously reported by the AHA (Mullner and McNeil, 1986).

Mergers, openings, and closures were the most important types of changes during PPS. Since few hospitals changed to or from acute care status from 1981 to 1986, the following sections will review trends in mergers, openings, and closures.

Mergers. The HER study documented only 23 post-PPS mergers, an increase of 35 percent from the 17 mergers from 1981 to 1983. Nearly 90 percent of these mergers were among nonprofit hospitals. More post-PPS mergers took place among urban hospitals than rural hospitals (Hendricks et al., 1988b).

Generally urban mergers involved one large hospital and one small hospital combining to form one hospital with 500 or more beds. Sixty-one percent of urban mergers from 1980 to 1986 produced a facility with 500 or more beds. In contrast, most rural mergers involved two or more hospitals with fewer than 100 beds joining to form a hospital with from 100 to 300 beds. In many cases, these mergers represented the consolidation of two or more hospitals within the same county.

Mergers resulted in the loss of almost 2 percent of inpatient beds during PPS and tended to involve hospitals with near average occupancy rates. Thus, merger activity apparently did not often involve low volume hospitals.

Mergers did not appear to be cost-reducing in the short run. During the TEFRA to PPS-3 period, hospitals involved in mergers had an approximately 19 percent greater increase in total operating cost per case during this period than hospitals with no status changes (Hendricks et al., 1988). Merging facilities also were 20 percent more costly per case under TEFRA than hospitals with no status changes during this period and were from 34 to 36 percent more costly from PPS-1 to PPS-3. These trends are short run and

may not reflect long run changes in financial status due to mergers.

Market share also did not appear to improve after mergers. Market share for merging urban hospitals did not change after merger while market share appeared to decline after merging for rural mergers. Possibly many patients in areas affected by rural mergers did not seek care at the newly-merged facility but at urban hospitals.

Openings and Closures. HER found that hospital openings during PPS were comparatively few in number (38) compared to pre-PPS openings (52). Openings often were proprietary institutions located in urban areas in four States (Louisiana, Texas, Florida, and California).

Many opening hospitals had low occupancy rates in their first year. Like mergers, opening hospitals had higher costs per case than hospitals with no change in status, but had less of an increase in cost per case from TEFRA to PPS-3 (Hendricks et al., 1988).

Ongoing research by AHA has found that 510 community and specialty hospitals closed between 1980 and 1987. More hospitals (97) closed in 1987 than in any year since 1980. At least 40 hospitals per year have closed since 1984 (Mullner et al., 1988). The 80 community hospitals closing in 1987 represent a 12.7 percent increase over the number of community hospital closures in 1986. A study by HER, funded by HCFA, found similar trends in closures from 1980 to 1985 (Hendricks et al., 1988b).

Although closures of whole hospitals appear to be the most viable solution to the problem of declining volume (Cleverley, 1988), closures resulted in only a 1 percent loss in beds in 1986. Only a relatively small percentage of beds were lost to closure from 1980 to 1985 (Mullner and McNeil, 1986).

Only a few States have had a large number of closures. Texas had the greatest number of closures in both 1986 and 1987. Many of these were rural

closures (Mullner et al., 1988). Longitudinal research by Mullner and McNeil (1986) and Hendricks et al., (1988) found that some areas have had consistently more closures over time. Texas, California, New York, and the Midwest have had more closures than other areas since 1980. These States are larger than average and have more hospitals than smaller States. However, these States do not appear to have higher ratios of beds per capita than States experiencing fewer closures.

Since 1983, rural closures have represented an increasing share of total closures and have disproportionately contributed to the growth in total closures during PPS (Hendricks, 1988). While urban hospital closing from 1980 to 1985 did not represent a major share of either inpatient admissions or outpatient visits in the counties where they were located, rural hospitals closing during this period accounted for 36 to 43 percent of county inpatient admissions and for 40 to 48 percent of county outpatient visits (Hendricks et al., 1988).

Closures tended to be small hospitals. In 1987, 76.2 percent of closing community hospitals had less than 100 beds while only three hospitals closing in 1987 had 200 or more beds. The typical closing community hospital averaged 73 beds (Mullner et al., 1988). Small hospitals have dominated community hospital closures since 1980 (Mullner and McNeil, 1986).

Proprietary hospitals represented 43.8 percent of all U.S. community hospitals closing in 1987 and have had higher rates of closure from 1980 to 1987 than either voluntary or Government hospitals. Proprietary hospitals may require higher operating margins to remain in operation since they cannot subsidize operating revenues with philanthropy or tax revenues. Proprietary hospitals also may be able to close more quickly than voluntary or Government hospitals (Hendricks et al., 1988).

From 1980 to 1985, urban closures varied in size from very small

facilities under 25 beds to facilities with 200 or more beds. Urban hospitals with less than 25 beds were the most overrepresented among closures and lost the greatest percentage of beds of any size group during this period. Only three rural closures were larger than 100 beds during this period (Hendricks et al., 1988).

Closing hospitals were more costly per case in their closing year than hospitals that did not change status, based on data from Medicare cost reports. Closures appear to be due to increasing cost per case coupled with declining volume (Hendricks et al., 1988). Longitudinal examination of cost and volume data for closures is required to verify long-term fiscal pressure in closing hospitals.

Almost 23 percent of the rural closures from 1980 to 1985 were the sole providers of inpatient care in their counties (Hendricks et al., 1988). About 61 percent of these rural monopoly closures had fewer than 25 beds. Most of these closures had declining occupancy rates and negative margins for several years. Most of these hospitals appear to have been in serious financial trouble prior to PPS and did not appear to benefit under PPS.

Hendricks et al., were unable to determine the access implications of rural hospital closures. While over half (52 percent) of these counties are adjacent to metropolitan statistical areas (MSAs), and inspection of road maps showed that almost all are near cities with a hospital, actual changes in hospital use patterns before and after closure were not determined.

HCFA is currently funding research at The Johns Hopkins University School of Public Health examining changes in inpatient utilization patterns in rural counties where hospitals have closed. This study will examine the access implications of rural hospital closures for county residents as well as spillover effects of closures in adjacent counties.

Impact on Capital Expenditures

In contrast to operating expenditures, capital-related expenditures have continued to be paid on a reasonable cost basis since FY 1984. Many observers suggest that capital expenditures have increased during PPS at least partially because the "pass-through" on capital implicitly subsidizes capital spending.

P.L. 99-509 (OBRA 86) reduced capital payments by 3.5 percent beginning in FY 1987. From November 21, 1987, through December 31, 1987, the rate of reduction in payments was increased to 7 percent. Sole community hospitals, however, were exempted from these reductions.

HER analyzed Medicare cost report data on hospital inpatient capital spending from TEFRA through PPS-3 (Adamache, 1988.) As shown in Table 4.8, total inpatient capital costs increased 14.4 percent annually from TEFRA to PPS3. Not surprisingly, given the decline in discharges, total inpatient capital costs per case increased more rapidly (20.8 percent). Because Medicare's share of total days and discharges fell during this period, Medicare inpatient capital costs increased somewhat less rapidly than total inpatient capital costs on both an aggregate and a per case basis (11.9 percent and 18.3 percent annually versus 14.4 and 20.8 percent annually, respectively). (Capital costs are apportioned to Medicare on the basis of a hospital's Medicare share of routine days and ancillary charges.)

Capital spending has also become an increasing proportion of total hospital expenditures, and the mix of depreciation and interest has changed. Adamache (1988) found that the ratio of capital to total operating costs increased from 8.6 percent in the TEFRA year to 11.3 percent in PPS3. Increases in the ratio of capital to operating costs also were found by ProPAC (1988) and Cleverley (1988). This sharply contrasts with the

5.5 to 5.9 percent of total expenditures accounted for by capital from 1971 to 1981 (Cramwell et al., 1985).

It is not possible to determine the extent to which this ratio has increased as a result of shifts in accounting costs in response to PPS or a genuine increase in the capital intensity of inpatient care. Depreciation for moveable equipment increased more rapidly (13.9 percent annually) than depreciation for building and fixtures (11.8 percent annually) from TEFRA to PPS-3 (Adamache, 1988). Again, it is not possible to determine whether this represents a real change or occurred because costs for moveable equipment can more easily be shifted from operating to capital categories.

Adamache found that interest costs were growing faster than total capital costs during this period. This could indicate increasing use of debt financing by hospitals. He speculates that this trend was probably due to increasing short-term, debt financed purchases of moveable equipment rather than long-term building and fixtures expenditures. Increasing interest costs may also be due to the major increase in refinancing occurring during 1984-1985 (ProPAC, 1988).

Adamache (1988) also found that the distribution of capital investment across hospital types was similar to the pattern reported in the 1986 Report to Congress. Capital investment levels were highest in large hospitals, urban hospitals, proprietary hospitals, and teaching hospitals and were lowest in small hospitals, rural hospitals, nonteaching hospitals, and Government hospitals. However, hospitals with low initial levels of capital investment have high rates of change in capital investment during PPS and are gaining ground in relative terms.

Innovation and Diffusion in Medical Technology Under PPS

Early concern that PPS would discourage further adoption of technological innovations seems unwarranted. The effects of high revenue margins and the pass-through of capital expenditures have apparently stimulated, rather than constrained, the medical technology marketplace. It remains to be seen whether the subsequent decline in hospital margins and reductions in PPS capital payments will slow spending for new technology.

PPS Impact on Medical Device Adoption

Although fixed payment per case creates an incentive against purchasing new technology as suggested in the 1986 Report to Congress (USDHHS, 1988), adoption of new medical technology has not slowed under PPS despite the extraordinary decline in volume during this period. Rather, a study of medical device adoption by HER found that the high revenue margins and incentives for purchasing quickly depreciable capital have increased the adoption of new inpatient medical technology (Cromwell and Pope, 1988).

Cromwell and Pope could not determine the net effect of volume decline. Declining volumes should make hospitals and potential credit sources risk adverse. But volume decline may have intensified inter-hospital, nonprice competition for physicians.

An update of findings presented in the 1986 Impact Report on the diffusion of some of these services shows that some complex technologies have continued to spread rapidly between 1984 and 1986 (Cromwell and Pope, 1988). In 1984, 46.8 percent of short-term hospitals had CT-scanners. In 1986, this percentage had increased to 59.2 percent.

Similarly, adoption of magnetic resonance imaging (MRI) increased from 3.3 percent of hospitals in 1983 to 6.7 percent in 1986.

Diagnostic ultrasound, open heart surgery and cardiac catheterization continued to diffuse after the implementation of PPS. Diagnostic ultrasound had diffused to 86 percent of hospitals in 1986 compared to 82 percent in 1984, suggesting that many small and rural facilities have ultrasound facilities.

Over 13 percent of hospitals had open heart surgery facilities in 1986 compared to 11.4 percent in 1984 and 19.7 percent of hospitals had cardiac cathetherization facilities in 1986 compared to 17.1 percent in 1984. This is noteworthy considering the expense and risk involved in a hospital's decision to enter this field. In contrast, core radiological technologies have diffused very slowly if at all.

Diffusion Across Hospital Types, Regions and MSAs. Cromwell and Pope (1988) have also updated findings in the 1986 Impact Report on differences in adoption patterns across hospital types and MSAs. They find that urban hospitals, teaching hospitals, and voluntary hospitals had adopted a greater percentage of complexity-expanding services than rural hospitals, nonteaching hospitals, proprietary, or Government hospitals.

Previous studies have shown that adoption levels are strongly related to hospital bed size (Russell, 1978). Cromwell and Pope (1988) also find this to be true. For both urban and rural hospitals, level of technology adoption increased with bedsize. Most of the regional, teaching, and ownership differences observed were found by Cromwell and Pope to be primarily related to bed size.

Although rural hospitals, particularly if they are small, have impressive rates of increase in adoption of services, they still had adopted only one-third of the complex technology offered in urban hospitals by 1986. Moreover, even though rural hospitals' percentage rate of adoption is higher than that of urban hospitals, urban hospitals actually adopted slightly more complex services during this period. Given the financial problems faced by the average small, rural hospital during this period, any adoption activity by these hospitals is worthy of note.

In the 1986 Report to Congress, the rapid diffusion of technological innovations across MSAs from TEFRA to PPS-1 was noted (USDHHS, 1986). Cromwell and Pope (1986) found that the trend toward rapid diffusion of new hospital technology across MSAs had continued into the third year of PPS.

Major increases in availability were found for CT-Scanners and for MRI. Open heart surgery, cardiac catheterization, hemodialysis, ultrasound, and megavolt radiation therapy also became more available. Only organ transplants appeared to have become more regionalized from 1984 to 1986.

PPS Impact on Medical Device Innovation

A study of the impact of PPS on medical device innovation by HER (Cromwell et al., 1988) found that the medical device industry appears to have fared well in the first years of PPS. The pass-through status of moveable equipment expenditures along with high margins in the first 2 years of PPS stimulated medical device sales which grew from 1983 to 1986 and should continue to grow in 1987 (Pollard and Persinger, 1987).

The medical device industry has continued to invest over 7 percent of sales in research and development, and the number of patents for new

devices increased by nearly 20 percent in 1986. None of the manufacturers interviewed by Cramwell et al., (1988) cut back on research and development expenditures during PPS. Shifting testing to ambulatory settings has not harmed medical device manufacturers since downsizing machines for outpatient clinics and freestanding diagnostic centers represent opportunities to provide new products to an expanded market.

Cramwell et al. (1988) found that moveable equipment manufacturers froze device prices in response to PPS. Other industry marketing strategies also appear to have changed. Under cost-based reimbursement, manufacturers marketed directly to physicians and stressed the "state-of-the-art" aspects of new products. In contrast, under PPS, cost-effectiveness of new devices has been increasingly stressed in marketing, and medical device manufacturers are increasing the amount of marketing done directly to hospitals.

Anderson and Steinberg (1984) suggested that, under PPS, manufacturers may feel the need to subsidize some hospital costs to promote device sales. Cramwell et al. (1988) found an example of this in the increasing practice of supplying devices upon case load demand, which shifts inventory costs back to the manufacturer.

Cramwell et al. (1988) also found that medical device innovation is more likely to be directed toward diseases that offer favorable reimbursement potential. They suggest, based on interviews with several medical research and development firms, that DRG reimbursement rates and the percent of Medicare cases within a DRG have increasingly affected product development decisions, although this process is still dominated by technological considerations.

Less expensive devices are sometimes used for Medicare patients to keep costs within DRG reimbursement limits. Also, under PPS, manufacturers tend

to direct marketing efforts to "winners" rather than "losers." Hospitals with high revenue margins thus became preferred marketing targets.

PPS may have less of an effect on medical device sales and innovation than other sources of Federal regulation (e.g., the Food and Drug Administration), acceptance of new products by private insurers, the current status of product liability litigation and current innovations in biotechnology and computer science (Cromwell et al., 1988; Pollard and Persinger, 1987).

Outpatient Hospital Services

The previous three annual PPS Impact Reports noted that ambulatory care is the fastest growing segment of the health care industry. This trend was evident even before the advent of PPS, and the growth continued in 1987 both for physician services and hospital-based ambulatory services. Since 1983, there have also been dramatic shifts from the inpatient to the outpatient setting in the provision of certain surgical procedures.

Until October 1, 1987, Medicare payment for the facility component of all ambulatory surgical services provided in a hospital outpatient setting was based upon retrospective, reasonable cost methodology. For the period October 1, 1987 through September 30, 1988, Medicare paid for these services based on the lowest of the hospital's costs, the hospital's charges, or a blended rate comprising 75 percent of the lesser of the hospital's costs or charges and 25 percent of the ambulatory surgical center (ASC) payment rate. HCFA will continue to move away from retrospective payments for hospital outpatient surgical and medical services. Future impact reports will examine the changing growth rates for these services.

Outpatient Hospital Services

In 1987, there was continued growth in the delivery of outpatient services for Medicare beneficiaries. Total emergency room visits by Medicare patients in 1987 were estimated to be 8.66 million, up 11.1 percent from 1986. On a per Medicare enrollee basis, however, the increase was 6.9 percent. Total clinic visits by Medicare patients in 1987 were estimated to be 6.42 million, up 8.5 percent from 1986. Per enrollee, the increase was 4.6 percent compared to 1986.

We also examined outpatient data from the AHA's National Hospital Panel Survey for all patients in general community hospitals. For all patients in general community hospitals, emergency room visits in 1987 totaled 88.0 million, up 3.0 percent from 1986; and clinic visits in 1987 totaled 47.7 million, up 6.2 from 1986. The average revenue generated per clinic visit went from about \$102 in CY 1986 to \$113 in CY 1987, an increase of over 10 percent.

Table 4.9 examines Medicare hospital outpatient versus inpatient utilization on a procedure specific basis for the period 1983 to 1985. We selected 14 ICD-9-CM surgical procedure codes based upon those performed most frequently in hospital outpatient department for Medicare beneficiaries during 1985. The inpatient data in Table 4.9 from HCFA's short stay hospital record file were derived from a 20 percent sample of Medicare beneficiary bills for 1983 and 1985. The number of surgical procedures for each ICD-9-CM code includes multiple procedures performed on a beneficiary during the year. The sample counts have been multiplied by five to estimate total procedures for the Medicare population. These counts are for specific ICD-9-CM codes, while the data in Table 2.2 are listed by DRG.

The outpatient data in Table 4.9 were derived by inflating HCFA's Annual 5 Percent Outpatient Skeleton Record File for 1983 and 1985. The number of surgical procedures for each ICD-9-CM code was derived by counting each instance where the code occurred in any of the three surgical code positions on the bill. These sample counts have been multiplied by 20 to estimate total procedures for the Medicare population.

The leading outpatient surgical procedures for Medicare beneficiaries showed very large increases in utilization: extracapsular extraction of lens (4,332 percent), insertion of intraocular lens (2,720 percent), flexible fiberoptic colonoscopy (1,825 percent), intracapsular extraction of lens (1,485 percent), endoscopy of large intestine (1,456 percent), endoscopy of small intestine (1,188 percent), breast biopsy (1,053 percent), proctosigmoidoscopy (1,010 percent).

An examination of the estimated inpatient utilization of the same surgical procedures listed above showed decreases or comparatively modest increases over the period 1983 to 1985: extracapsular extraction of lens (-55 percent), insertion of intraocular lens (-44 percent), flexible fiberoptic colonoscopy (+193 percent), intracapsular extraction of lens (+84 percent), endoscopy of large intestine (+63 percent), endoscopy of small intestine (+143 percent), breast biopsy (+5 percent) and proctosigmoidoscopy (+27 percent).

Several factors help explain these large outpatient increases. One factor is the Medicare reimbursement mechanism. Since Medicare reimbursement for outpatient care is not subject to a per case, prospective DRG rate, hospitals can increase their Medicare revenues by shifting more

costs or services to outpatient departments. Some factors are related to changing practice patterns. For example, the extracapsular extraction--rather than the intracapsular extraction--is now the most popular type of cataract operation because it reduces post-operative complications. Extracapsular extraction resulted in a major change in medical practice: the increase in the insertion of the intraocular lens at the time of cataract extraction. Other factors are the advances in modern medical technology, including improved anesthetic agents and the widespread use of more sophisticated techniques. For example, the new technologies in the field of flexible fiberoptic medical devices are allowing physicians to perform certain endoscopic procedures more readily on an outpatient basis.

ASCs

The Medicare prospective payment methodology for ASCs has also been revised recently. HCFA expanded the number of payment groups from four to six and modified the methodology for calculating the payment rates. In addition, for an intraocular lens implanted during cataract surgery, the facility rate now incorporates the payment for the lens. Multiple surgical procedures performed in an ASC continue to be paid at 100 percent of the highest payment group and 50 percent of the applicable payment group for all other surgical procedures performed.

There has been steady growth in the number of Medicare-certified ASCs. In 1983, there were only 87 ASCs certified by Medicare. By 1987, there were 851, an increase of almost ten-fold. The areas with the greatest concentration of ASCs continue to be California, the far west, and the southern States. Table 4.10 shows the growth in the number Medicare-certified ASCs by region since the beginning of PPS.

REFERENCES

Adamache, K. "Trends in Capital Costs Under Prospective Reimbursement," Unpublished Working Paper, Health Economics Research, Inc., Needham, MA. October, 1988

Anderson, G. and Steinberg, E. "To Buy or Not To Buy: Technology Acquisition Under Prospective Payment," New England Journal of Medicine, V. 311, No. 3, pp. 182-185, July 19, 1984.

Carter, G. Personal Communication, January, 1989.

Cleverley, W. "Strategic Operating Indicators Point to Equity Growth," Health Care Financial Management, V. 42, No. 7, pp. 54-65, July, 1988.

Coyne, J. "Hospital Performance in Multihospital Systems: A Comparative Study of System and Independent Hospitals," Health Services Research, V. 17, No. 4, pp. 315-329, Winter, 1982.

Cromwell, J. and Pope, G. "The Impact of Medicare's Prospective Payment System on Technology Diffusion," Unpublished Working Paper, Health Economics Research, Inc., Needham, MA. November, 1988

Cromwell, J., Wedig, G. and Butrica, B. "The Impact of Medicare's Prospective Payment System on Medical Device Innovation," Unpublished Working Paper, Health Economics Research, Inc., Needham, MA. November, 1988

Cromwell, J., Wedig, G. and Sloan, F. "Medicare and Medicaid Payment Policies and Hospital Capital Formation," Unpublished Working Paper, Health Economics Research, Inc., Needham, MA. September, 1985

Department of Health and Human Services. Secretary's Commission on Nursing: Final Report. Washington, DC: U.S. Government Printing Office, December, 1988.

Ermann, D. and Gabel, J. "Multihospital Systems: Issues and Empirical Findings," Health Affairs, V. 3, No. 1, pp. 50-64, Spring, 1984.

Feder, J., Hadley, J. and Zuckerman, S., "How Did Medicare's Prospective Payment System Affect Hospitals?" New England Journal of Medicine, V. 317, No. 14, pp. 867-873, October 1, 1987.

Federal Register, V. 49, No. 174, p. 34771, August 31, 1984.

Hadley, J., Zuckerman, S. and Feder, J. "Profits and Fiscal Pressure in the Prospective Payment System: Their Impact on Hospitals," Unpublished Working Paper, Georgetown University, Center for Health Policy Studies, Washington, DC. October, 1988

Hendricks, A. "The Prospective Payment System's Impact on Rural Hospitals: Overview of Nine Case Studies," Unpublished Working Paper, Health Economics Research, Inc., Needham, MA. November, 1988

Hendricks, A., Dresser, M., Alberts, D. and Stone, A. "Medicare's Prospective Payment System and Changes in the Status of Acute Care Hospitals," Unpublished Working Paper, Health Economics Research, Inc., Needham, MA. September, 1988b.

Hendricks, A., Sitaram, K. and Dresser, M. "Multihospital System Affiliations Among Acute-Care Hospitals Under Medicare's Prospective Payment System," Unpublished Working Paper, Health Economics Research, Inc., Needham, MA. November, 1988a.

Levitz, G. and Brooke, P. "Independent Versus System-Affiliated Hospitals: A Comparative Analysis of Financial Performance, Cost and Productivity," Health Services Research, V. 20, No. 3, pp. 315-339, August, 1985.

Mennemeyer, S. "Effects of the Prospective Payment System on Hospital Costs, Utilization and Financial Condition," Unpublished Working Paper, Abt Associates, Inc., Cambridge, MA. November, 1988

Merrill, K. "Isolating the Effect of PPS on Hospital Behavior: Another Look at the PPS Impact Index and Its Use," Unpublished Working Paper, Abt Associates, Inc., Cambridge, MA. August, 1988

Mullner, R. and McNeil, D. "Urban and Rural Closures: A Comparison," Health Affairs, V. 5, No. 3, pp. 131-141, Fall, 1986

Mullner, R., Whiteis D. and McNeil, D. "Record Year For Closures in 1987," Hospitals, V. 62, No. 7, pp. 33-36, April 5, 1988

Pollard, M. and Persinger, G. "Investment in Health Care Innovations," Health Affairs, V. 6, No. 2, pp. 131-141, Summer, 1986

Prospective Payment Assessment Commission, Medicare Prospective Payment and The American Health Care System: Report to Congress, 1988. Washington, DC: U.S. Government Printing Office, July 1988.

Russell, L. Technology in Hospital: Medical Advances and Their Diffusion, Washington, DC: Brookings Institution, 1979.

TABLE 4.1

Comparison of PPS Operating Margins and Total
Margins for the First 4 PPS Years

	PPS-1 (1984)	PPS-2 (1985)	PPS-3 (1986)	PPS-4 (1987)
Medicare Cost Report Data*				
Medicare Operating Margin**	14.5%	14.5%	9.3%	4.3%
Total Margin***	8.6	7.9	6.7	4.4
AHA Data Total Margin***				
	6.2	5.9	5.1	4.7

*Based on a cohort of 3,503 hospitals with usable Medicare Cost Report data in the PPS-1 through PPS-4 years. Cost reports are for hospital accounting years beginning in FY 1984, 1985, etc. AHA data are from their National Hospital Panel Survey and apply to calendar years, and are not based on a constant cohort. Using a variable number of hospitals across the years would have little effect on the Medicare margins.

**PPS margins are PPS operating payments minus Medicare operating costs divided by PPS operating payments. Capital, direct medical education, and kidney acquisition pass-through costs are excluded.

***Total margins for Medicare and AHA data are total patient and other operating revenues minus total expenses divided by total revenues. Cost accounting rules may differ between the Medicare and AHA data, however.

Table 4.2
TEFRA and PPS Operating Margins and Annual Percentage
Changes in Key Variables for PPS 1, 2, 3, & 4

	<u>TEFRA**</u>	<u>PPS-1</u>	<u>PPS-2</u>	<u>PPS-3</u>	<u>PPS-4</u>	<u>Cumulative Percent Change</u>
Medicare Operating Margin*	2.18	14.48	14.38	9.08	4.08	
Percent Change From preceding year in:						
PPS Operating Revenue per Case*	16.2	9.9	3.2	3.7	36.78	
Medicare Operating Cost per Case*	1.7	10.1	9.6	9.3	34.1	
Medicare Discharges*	-5.2	-6.1	-3.6	-1.1	-16.9	
Hospital Market Basket Input Price Index	4.9	4.0	3.0	3.5	16.3	
Length of Stay*	-12.1	-0-	.1	-0-	-12.0	
Medicare Case Mix Index	N/A	3.2	2.8	2.4	8.6	
Update Factor	4.7	4.5	0.5	1.15	11.2	

*For a matched set of 3,225 hospitals with usable Medicare Cost Report data in all 5 yrs.

**Margin is greater than zero due to incentive features of TEFRA payment rules.

Table 4.3

MEDICARE CASE MIX INDEX TRENDS BY HOSPITAL GROUP*

<u>Hospital Group</u>	Case Mix Index			Percentage Difference				
	FY84	PPS FY85	Stays FY86	FY87	PPS FY84-85	PPS FY85-86	PPS FY86-87	PPS FY84-87
All hospitals	1.1331	1.1813	1.2144	1.2434	+ 4.3	+ 2.8	+ 2.4	+ 8.6
Urban	1.1701	1.2204	1.2561	1.2863	+ 4.3	+ 2.9	+ 2.4	+ 8.8
o <100 beds	1.0319	1.0683	1.0941	1.1200	+ 3.5	+ 2.4	+ 2.4	+ 7.4
o 100-404 beds	1.1442	1.1910	1.2217	1.2486	+ 4.1	+ 2.6	+ 2.2	+ 8.0
o 405-684 beds	1.2264	1.2884	1.3322	1.3650	+ 5.1	+ 3.4	+ 2.5	+ 10.1
o 685+ beds	1.2887	1.3413	1.3904	1.4255	+ 4.1	+ 3.7	+ 2.5	+ 9.5
Rural	1.0345	1.0662	1.0877	1.1095	+ 3.1	+ 2.0	+ 2.0	+ 6.1
o <100 beds	0.9967	1.0205	1.0338	1.0483	+ 2.4	+ 1.3	+ 1.4	+ 4.1
o 100-169 beds	1.0445	1.0778	1.1027	1.1254	+ 3.2	- 2.3	+ 2.1	+ 6.6
o 170+ beds	1.0851	1.1274	1.1542	1.1824	+ 3.9	+ 2.4	+ 2.4	+ 7.3
New England	1.1610	1.1876	1.2427	1.2648	+ 2.3	+ 4.6	+ 1.8	+ 7.8
Mid-Atlantic	1.1527	1.1856	1.2087	1.2333	+ 2.9	+ 1.9	+ 2.0	+ 5.9
South Atlantic	1.1267	1.1736	1.2063	1.2466	+ 4.2	+ 2.8	+ 3.3	+ 9.5
E. No. Central	1.1276	1.1741	1.2106	1.2359	+ 4.1	+ 3.1	+ 2.1	+ 8.5
E. So. Central	1.0706	1.1163	1.1407	1.1637	+ 4.3	+ 2.2	+ 2.0	+ 7.6
W. No. Central	1.1366	1.1916	1.2281	1.2549	+ 4.8	+ 3.1	+ 2.2	+ 9.3
W. So. Central	1.1054	1.1583	1.2047	1.2406	+ 4.8	+ 4.0	+ 3.0	+ 11.1
Mountain	1.1608	1.2185	1.2455	1.2688	+ 5.0	+ 2.2	+ 1.9	+ 8.2
Pacific	1.1980	1.2503	1.2744	1.2986	+ 4.4	+ 1.9	+ 1.9	+ 7.3
Major Teaching	1.2780	1.3427	1.3873	1.4205	+ 5.1	+ 3.3	+ 2.4	+ 10.0
Other Teaching	1.2137	1.2600	1.3024	1.3320	+ 3.8	+ 3.4	+ 2.3	+ 8.6
Non-Teaching	1.0837	1.1251	1.1515	1.1787	+ 3.9	+ 2.3	+ 2.4	+ 7.6
Not-for-Profit	1.1552	1.2046	1.2394	1.2683	+ 4.3	+ 2.9	+ 2.3	+ 8.6
Proprietary	1.0892	1.1363	1.1655	1.1970	+ 4.2	+ 2.6	+ 2.7	+ 8.8
Government	1.0806	1.1263	1.1553	1.1820	+ 4.1	+ 2.6	+ 2.3	+ 8.3
Dispropor. Share	1.1621	1.2150	1.2470	1.2765	+ 4.6	+ 2.6	+ 2.4	+ 8.7
Rural Ref. Ctrs.	1.1128	1.1571	1.1820	1.2081	+ 4.0	+ 2.2	+ 2.2	+ 7.4
Sole Community	1.0579	1.0868	1.1026	1.1278	+ 2.7	+ 1.5	+ 2.3	+ 5.5

* Based on discharges paid under PPS for all facilities included under PPS on 9/30/84. Discharges from PPS exempt facilities and special units and all discharges in New York, Maryland, New Jersey or Massachusetts are excluded.

NOTE: Data in this table are based on bills processed by HCFA through December 1987, and are thus preliminary and subject to revision. FY84 CMI data have been adjusted to be comparable to CMI data for FY 85-87. This adjustment (see Federal Register, V. 49, No. 170, August 31, 1984, p. 34771) reflects the FY85 reduction in DRG relative weights of 1.05% to meet the TEFRA budget neutrality requirement.

Source: Health Care Financing Administration, Bureau of Data Management and Strategy.

Table 4.4

Distribution of Medicare Operating Margins
for the First Four Years of PPS

Percentiles	PPS-1	PPS-2	PPS-3	PPS-4
10th	-4.3	-6.1	-14.0	-22.5
25th	4.4	3.0	-3.2	-9.0
50th	11.5	11.2	5.8	1.8
75th	17.8	18.1	13.3	10.6
90th	22.9	24.0	19.8	17.9
Percent of Hospitals with Positive Margins	84.2%	81.8%	67.7%	55.1%

Source: HCFA estimates based on Medicare Cost Report data for a cohort of 3,503 hospitals.

Table 4.5

Actual PPS operating margins for PPS-1,2,3 and 4*, based on maximum number of cost reports available each year

	PPS-1		PPS-2		PPS-3		PPS-4	
	Number of hospitals	Margin						
All hospitals	4,745	14.1	4,810	14.1	4,831	9.6	4,555	5.0
Urban	2,389	15.3	2,445	15.0	2,513	10.7	2,329	6.0
1-100 beds	537	12.8	526	12.3	544	6.8	489	1.6
100-199 beds	623	13.6	658	13.1	655	8.2	610	3.4
200-299 beds	499	14.0	505	13.1	531	8.5	477	3.5
300-399 beds	524	15.0	545	14.9	552	10.9	530	6.2
400 beds or more	205	18.1	211	18.2	230	13.9	218	9.7
Rural	2,356	8.3	2,365	8.9	2,318	3.1	2,226	-0.8
1-50 beds	960	6.2	974	5.8	956	-1.6	888	-3.2
50-99 beds	778	8.2	777	7.6	759	*1.7	729	-1.9
100-149 beds	344	8.6	346	7.5	331	1.7	330	-1.7
150-199 beds	138	8.1	136	8.8	134	4.7	136	0.6
200 beds or more	136	9.1	131	13.1	139	6.8	138	1.2
Major teaching	133	18.4	137	20.6	152	18.1	140	13.6
Other teaching	753	16.0	754	15.7	771	11.5	750	7.1
Non teaching	3,859	12.0	3,919	11.5	3,908	6.6	3,665	1.4
Special Treatment Rural								
Non-SCH/RRC Rural	1,873	8.1	1,889	6.6	1,846	0.4	1,768	-3.4
Sole Community Hospital	273	6.2	274	6.2	272	1.2	256	-2.4
Rural Referral Center	182	9.5	176	14.2	175	8.5	179	3.9
SCH and RRC	21	7.0	20	8.5	19	10.2	18	5.9
Urban teaching & disproportionate share (DSH)								
Urban teaching & DSH	378	16.9	374	17.7	416	14.5	389	11.0
Urban teaching & not DSH	443	16.4	453	16.2	443	11.9	433	6.9
Urban non-teaching & DSH	433	13.2	442	12.9	470	8.7	432	5.4
Urban non-teaching & not DSH	1,135	13.7	1,176	12.8	1,184	7.1	1,075	1.1

*For margin definition, see Table 4.1

Table 4.6

Actual PPS Operating Margins for PPS-1, 2, 3, and 4 for a Cohort of 3,225 Hospitals*

	Number of hospitals	PPS-1	PPS-2	PPS-3	PPS-4
All hospitals	3,225	14.4	14.3	9.0	4.0
Urban	1,586	15.5	15.2	10.0	4.8
1-100 beds	353	14.3	14.2	8.9	3.6
100-199 beds	413	14.0	13.1	8.3	3.3
200-299 beds	336	14.1	13.0	7.9	2.7
300-399 beds	357	15.4	15.4	10.4	5.7
400 beds or more	127	18.2	18.3	12.5	6.5
Rural	1,639	8.7	9.3	3.6	-0.2
1-50 beds	660	7.0	5.8	-0.9	-3.6
50-99 beds	541	9.0	7.9	1.8	-1.0
100-149 beds	249	8.7	8.1	2.5	-1.2
150-199 beds	96	7.4	8.8	3.8	-0.4
200 beds or more	93	10.0	14.0	8.4	3.0
Major teaching	75	19.1	21.9	17.1	11.9
Other teaching	475	16.5	16.3	11.2	6.0
Non-teaching	2,675	12.3	11.7	6.2	1.5
Special Treatment Rural					
Non-SCH/RRC Rural	1,302	8.4	6.7	0.5	-3.3
Sole Community Hospital	190	7.2	7.3	1.9	-1.1
Rural Referral Center	130	10.0	15.1	9.9	5.6
SCH and RRC	14	7.5	13.0	9.6	3.9
Urban teaching and disproportionate share	231	17.0	17.6	13.0	9.0
Urban teaching and not DHS	279	17.0	17.0	11.6	5.6
Urban non-teaching and DHS	304	13.3	13.3	8.1	5.3
Urban non-teaching and not DHS	772	14.2	12.9	7.4	1.3

*PPS operating margin is defined in Table 4.1.

Comparison of Urban and Rural Hospitals' TEFRA and PPS
Operating Margins and Annual Percentage Changes
in Key Variables, PPS-1, 2, 3, 4

	TEFRA*	PPS-1	PPS-2	PPS-3	PPS-4	CUMULATIVE PERCENT CHANGE
Medicare Operating Margin†						
URBAN	2.11	15.52	15.21	10.21	4.81	
RURAL	2.1	8.7	9.3	3.6	-.2	
PERCENT CHANGE FROM PRECEDING YEAR IN:						
PPS Operating Revenue Per Case‡						
URBAN	17.6	9.7	3.1	3.2	37.32	
RURAL	8.7	9.4	2.9	4.9	28.4	
Medicare Operating Cost Per Case‡						
URBAN	1.5	10.1	9.4	9.2	33.5	
RURAL	1.5	8.7	9.4	9.1	31.7	
Medicare Discharges‡						
URBAN	-4.6	-5.5	-3.1	-.6	-14.5	
RURAL	-7.0	-7.9	-4.9	-2.5	-24.1	
Length of Stay‡						
URBAN	-12.5	-0-	.1	-0-	-12.4	
RURAL	-13.9	.1	.0	-0-	-13.9	
Medicare Case Mix						
URBAN	N/A	4.3	2.9	2.4	9.9	
RURAL	N/A	3.1	2.0	2.0	7.3	

*Matched set of 3,225 hospitals with useable data in all 5 years.

†Margins are greater than zero due to incentive features of TEFRA payment rules.

TABLE 4-8*

MEDICARE CAPITAL COSTS FOR SHORT TERM ACUTE CARE HOSPITALS IN NON WAIVERED STATES, BY YEAR

CAPITAL COST PER HOSPITAL

	<u>TEFRA</u>	<u>PPS1</u>	<u>PPS2</u>	<u>PPS3</u>	Annual Percent Change Between <u>TEFRA</u> and <u>PPS3</u>
Total Facility Capital Costs (includes LTC beds, etc.)	\$1,401,416	\$1,601,826	\$1,888,350	\$2,166,119	14.5%
Total Hospital Capital Costs (excludes LTC beds, etc.)	1,391,408	1,590,290	1,871,985	2,146,171	14.4
Total Depreciation**	874,855	1,009,653	1,143,376	1,264,657	12.3
-Buildings and Fixtures**	560,177	642,426	732,782	798,616	11.8
-Movable Equipment**	427,769	501,472	572,766	648,166	13.9
Title 18 Capital Costs	497,762	517,610	634,338	711,623	11.9

COST PER DISCHARGE

	<u>TEFRA</u>	<u>PPS1</u>	<u>PPS2</u>	<u>PPS3</u>	Annual Percent Change Between <u>TEFRA</u> and <u>PPS3</u>
Total Facility Capital Costs/Discharge (includes LTC beds, etc.)	\$218	\$265	\$337	\$406	20.7%
Total Hospital Capital Costs/Discharge (excludes LTC beds, etc.)	211	257	326	393	20.8
Total Depreciation/Discharge**	134	167	202	236	18.9
-Buildings and Fixtures**	87	107	131	154	18.8
-Movable Equipment**	65	81	99	117	19.8
Title 18 Capital Costs/Discharge***	225	249	332	390	18.3

COST AS A PERCENTAGE OF TOTAL OPERATING EXPENDITURES

	<u>TEFRA</u>	<u>PPS1</u>	<u>PPS2</u>	<u>PPS3</u>
Total Facility Capital Costs (includes LTC beds, etc.)	8.6%	9.5%	10.6%	11.3%
Total Hospital Capital Costs (excludes LTC beds, etc.)	8.3	9.2	10.2	10.9
Total Depreciation**	5.4	6.1	6.5	6.7
-Buildings and Fixtures**	3.5	3.9	4.2	4.3
-Movable Equipment**	2.6	3.0	3.3	3.4
Title 18 Capital Costs****	8.0	8.7	10.4	11.0

Note: Reported values are unweighted averages.
Annual change data in Column 5 is $\ln(PPS3/TEFRA)/3$.

Text Notes: *Only for those hospitals which had MCRs available for all four periods.

**Before reclassification or adjustment.

***As a percentage of Medicare Inpatient Discharges.

****As a percentage of Medicare Inpatient Costs.

Source: Adamache (1988).

TABLE 4-9 : ESTIMATED MEDICARE USE OF SELECTED PROCEDURES, INPATIENT VERSUS HOSPITAL OUTPATIENT, 1983 and 1985

ICD-9-CM PROCEDURE CODE	DESCRIPTION	HOSPITAL INPATIENT PROCEDURES		HOSPITAL OUTPATIENT PROCEDURES	
		1983	1985 Percent Change	1983	1985 Percent Change
13.71	Insertion of intraocular lens prostheses at time of cataract extraction, one-stage	181,930	101,170 -44.4	10,160	286,460 +2719.5
45.24	Endoscopy of large intestine (may be combined with upper G.I. tract endoscopy)	103,825	168,765 +62.5	10,000	155,640 +1456.4
57.32	Transurethral cytscopy	251,060	326,410 +30.0	23,000	129,000 +460.9
86.3	Local excision or destruction of lesion or tissue of skin and subcutaneous tissue	43,450	41,020 -05.6	16,800	110,240 +556.2
13.19	Intracapsular extraction of lens	174,830	27,995 -84.0	6,180	97,920 +1484.5
45.13	Endoscopy of small intestine	85,635	207,850 +142.7	4,100	52,800 +1187.8
13.59	Extracapsular extraction of lens	163,920	74,370 -54.6	4,020	178,180 +4332.3
45.23	Flexible fiberoptic colonoscopy	25,725	75,440 +193.3	2,180	41,960 +1824.8
86.59	Suture of skin and subcutaneous tissue of other sites	6,625	21,195 +219.9	4,040	39,920 +888.1
44.13	Gastroscopy	42,865	50,235 +17.2	4,780	37,980 +694.6
48.23	Proctosigmoidoscopy	33,625	42,640 +26.8	2,360	26,200 +1010.2
69.09	Dilation and curettage	32,620	24,340 -25.4	2,480	22,760 +817.7
04.43	Release of carpal tunnel nerve	16,050	7,320 -54.4	2,780	22,540 +710.8
85.12	Biopsy of breast	22,440	23,445 +04.5	1,840	21,220 +1053.3

Source: HCFA/Bureau of Data Management and Strategy: Data from the Medicare Statistical System.

Table .10 NUMBERS OF MEDICARE CERTIFIED AMBULATORY SURGICAL CENTERS, 1983-87

HCFA Region	1983	1984	1985	1986	1987
I (Boston)	0	4	10	24	33
II (New York)	4	6	6	26	39
III (Philadelphia)	5	11	19	41	59
IV (Atlanta)	31	59	90	125	153
V (Chicago)	16	25	42	68	96
VI (Dallas)	0	18	65	103	118
VII (Kansas City)	10	13	20	25	32
VIII (Denver)	5	14	24	34	35
IX (San Francisco)	16	83	124	189	242
X) (Seattle)	0	21	29	39	44
Totals¹	87	254	485	674	851

Source: HCFA/Health Standards and Quality Bureau, Medicare and Medicaid Automated Certification System

¹Totals are for calendar years, ending December 29.

Chapter 5

IMPACT ON OTHER PAYERS

The principal impacts of Medicare PPS are on program beneficiaries and on providers paid under PPS. However, the 1985 and 1986 Reports and other research have presented evidence of indirect impacts on payers other than the Medicare program (USDHHS, 1987; USDHHS, 1989; Guterman et al., 1988). This section provides a brief overview of public and private payers in the market for health care services in 1987. It focuses on changes since 1980. In particular, it identifies changes since the implementation of PPS and examines the possible role of PPS in bringing about these changes.

It is difficult in the study of PPS impact on other payers to establish clear causal links between the enactment and implementation of PPS and changes affecting these payers. This section discusses evidence of PPS effects on Medicaid program structure and payments and on Blue Cross utilization and payments. It then describes changes in private health insurance markets for which the implementation of PPS is at least an important feature of a rapidly changing health care financing environment but where clear evidence does not now exist that PPS caused developments.

The section draws on data provided by HCFA's Office of the Actuary for an overview of hospital payment (HCFA, unpublished). A special study for HCFA by Abt Associates, Inc., provided information on structure and payment trends among Medicaid programs (Gabay et al., 1988). Analysis of Blue Cross plan data in research by the Blue Cross and Blue Shield Association and conducted by researchers at the University of California provided information on impacts of PPS on Blue Cross utilization and payments (Scheffler et al., 1988). Analyses of surveys by the U.S. Bureau of Labor Statistics (BLS) and the Health Insurance Association of America provided detailed information on recent developments in the market for private health insurance and on the behavior of insurers in the 1980s (Gabel et al., 1987; Gabel et al., 1988; Jensen and Gabel, 1988; Short, 1988).

The work reported supplements that in the 1985 and 1986 Reports by reviewing the status of the development of prospective Medicaid payment systems, Blue Cross cost containment activity, the expansion of managed care, and the growth of self-insurance. New findings on Medicaid include clear evidence of a shift toward DRG-based systems and stronger evidence than previously reported that prospective systems reduce Medicaid expenditures per recipient. New findings on Blue Cross utilization and payments include estimates from econometric models indicating that PPS reduces inpatient payments for patients under 65 years of age even after controlling for private sector cost containment actions and other factors. New findings on managed care indicate a significant expansion of cost containment measures among traditional group health insurance plans, with such measures now covering one-third of enrollees in such plans. Finally,

by 1987 over half of persons with conventional employer-sponsored health insurance were covered by plans with some element of self-insurance, resulting in a shift of power and risk from traditional insurers to the nation's employers.

Despite the changes reported and the widespread evidence of cost containment activity among private and public payers, health insurance costs continue to increase. Health insurance premiums increased 12 percent from 1987 to 1988. Estimates of increases from 1988 to 1989 are higher.

The Health Insurance Market

The distinctive feature of the market for health care services in the United States is the great prevalence of insurance for health care costs. This generally entails payment of these costs by third parties rather than by the consumers who receive the services.

Most private health insurance is obtained through employment. In 1986, 74 percent of the population under 65 years of age had private insurance and 66 percent had employment-related insurance. These levels represent modest declines from values of 77 percent and 69 percent, respectively, in 1977 (Short, 1988). They are consistent with approximately equal but proportionately larger increases in the uninsured population from 12.3 percent to 15.5 percent of the total population (including those 65 years of age and older) between 1977 and 1987 (Short et al., 1988). Private health insurance has paid for an increasing share of the nation's hospital costs since 1985 (Table 5.1). This largely reflects a higher rate of expenditure increase by private than by public payers since 1985. In particular, Medicare expenditures have grown more slowly than private third

party payments, reducing Medicare's market share in hospital payment. These trends reverse those reported in the 1986 Report (USDHHS, 1989).

Within the group health insurance market, studies by non-Federal researchers indicate a continuing growth in the share of traditional managed care insurers—health maintenance organizations (HMOs) and preferred provider organizations (PPOs)—as well as of managed fee-for-service (conventional insurance with strong utilization and cost management elements). These studies also show an increased use of self-insurance. Anecdotal evidence indicates financial difficulties and possible continuing loss of market share by traditional Blue Cross and Blue Shield plans (Kenkel, 1988; Scheffler et al., 1988).

There remains some concern that PPS may be leading hospitals to shift costs not paid by Medicare to other payers. Research is not in agreement on this point. Studies have examined commercial insurers thus excluding Blue Cross and Blue Shield experience. One study of hospital data for the 1980-84 period examined the effect on hospital commercial markup (hospital commercial insurance revenue per day divided by cost per day) of the Medicare payment system by comparing hospitals under PPS, pre-PPS TEFRA and waiver State payment systems. Whether a hospital was paid under PPS or TEFRA did not affect commercial markup, suggesting that PPS did not lead to cost shifting in the period studied (Zuckerman and Hadley, 1988). However, a preliminary study using 1984-85 data found that the percentage increase in hospital commercial insurance revenue was positively and significantly associated with the degree of PPS fiscal pressure on a hospital (Hadley, Feder, and Zuckerman, 1988). This suggests that PPS led hospitals to shift

costs. Since both studies use data from years soon after implementation of PPS it is uncertain whether the findings apply to more recent years.

Recent evidence of health insurance premium increases suggests that providers may be able to shift costs to private payers and thereby to employers and individuals. Health insurance premiums increased 12 percent from the spring of 1987 to the spring of 1988. Estimates of increases in 1989 are even higher, with even HMOs increasing premiums by an average of 16.9 percent (Mullen, 1988). These increases may partly reflect pricing cycles and underwriting patterns in the insurance industry and pertain to general health insurance rather than to coverage for hospital costs alone. Nonetheless, they suggest that, despite widespread cost containment efforts, payers may still be facing substantial cost increases.

Changes in Health Insurance Markets and Impacts of Medicare

Prospective Payment

The most striking changes in the market for health insurance are the expansion of prospective payment among private and public payers, new cost containment initiatives, the growth of managed care, and the greater role of self-insurance (Gabel et al., 1988; Jensen and Gabel, 1988). The discussion below focuses first on Medicaid and Blue Cross, where there is evidence of PPS effects. It then describes changes in those areas of private insurance where current evidence does not demonstrate a clear impact of PPS.

Medicaid

Medicaid is a health program for the poor run by the States and jointly financed by the States and the Federal Government. Since 1980, many States have ceased paying hospitals under Medicaid on the basis of traditional

Medicare principles of cost reimbursement and have begun paying them rates that are set prospectively. Such States set rates in advance of service provision and do not reconcile total payments to total costs at year's end.

The 1985 and 1986 Reports and other research have reported the trend toward prospective payment under Medicaid (USDHHS, 1987; USDHHS, 1989; Singer, 1986; Guterman et al., 1988). In 1980, seven States operated prospective Medicaid systems covering 16 percent of Medicaid recipients. By 1987, 40 States operated prospective systems covering 91 percent of recipients. The largest single increase in prospective systems occurred in 1983. In 1987 only six States had Medicaid programs that exclusively used Medicare cost reimbursement rules. The 1985 and 1986 Reports have documented the structural features of prospective Medicaid programs (USDHHS, 1987; USDHHS, 1989). It is now clear that the use of DRGs as the unit of payment is the most important single structural feature of the current generation of prospective Medicaid programs.

In 1987, 14 of the States with prospective Medicaid programs operated DRG-based systems, all but one of which were established since 1983 and 3 of which were new since 1986. As of September 1988, eight more States were considering adoption of DRG-based systems, five of which would replace retrospective systems. By contrast, adoption of non-DRG based systems has essentially halted since 1983. Many of the structural features of DRG-based systems are based on PPS (Singer, 1986). By 1987, such systems covered 31 percent of Medicaid recipients.

The 1986 Report discussed--but was unable to determine--the effect of DRG based systems on inpatient or total Medicaid expenditures (USDHHS, 1989). New data are now available to assess the impact of Medicaid

prospective payment. Adoption of prospective payment, and especially DRG based systems, appears to be associated with reduced growth rates of inpatient hospital expenditures per recipient. Over the 1980-87 period hospital expenditures per recipient in States without all-payer systems grew 8.3 percent per year in retrospective States, 7.4 percent per year in States that changed from retrospective to non-DRG based prospective systems, and 6.3 percent per year in States that changed from retrospective to DRG based systems. Examination of total Medicaid expenditures per recipient suggests that prospective systems have reduced inpatient costs without raising nonhospital costs (Gabay et al., 1988).

The inpatient Medicaid expenditure findings contrast with results for the pre-1984 period, which indicated limited ability of prospective Medicaid programs to contain hospital expenditures per recipient other than as part of certain all-payer regulatory systems (Zuckerman, 1987; Zuckerman and Holahan, 1988). The discussion of different system types above suggests that DRG based prospective systems have been successful in reducing expenditure growth. However, the comparisons do not take into account possible effects of program maturity, other State cost control actions, or inter-State demographic and economic differences. Further analysis will be necessary to determine whether the comparisons of descriptive statistics accurately represent differences between payment system types rather than other factors.

Blue Cross and Blue Shield Plans

Blue Cross enrollment accounts for about one-third of the market for private health insurance. As discussed in the 1985 and 1986 Reports, Blue Cross and Blue Shield plans have been losing market share, as measured by

benefits paid, since the 1960s (USDHHS, 1987; USDHHS, 1989; Kenkel, 1988). Blue Cross plans alone have experienced membership declines of over 11,000,000 from approximately 83,000,000 members in 1980 to less than 72,000,000 in 1986, for 61 of 62 plans (Scheffler, 1988). They have responded to adverse circumstances and a more competitive environment with a variety of cost containment measures, such as concurrent utilization review and mandatory second opinion programs. In addition, plans report information on which method of calculation of hospital payment accounts for the largest share of plan payments (the primary method of hospital payment). These data indicate that, for 61 of 62 plans for which data are available, 31 used some form of prospective payment as primary method of hospital payment in 1980 and that 48 used such a method in 1986. The fraction of Blue Cross members enrolled in HMOs and PPOs has increased from 0.6 percent and zero, respectively, in 1980 to 4.3 percent and 6.3 percent in 1986 (Scheffler, 1988).

Research by the Blue Cross and Blue Shield Association using data on Blue Cross members under 65 years of age has examined both the effect of plan cost containment measures and the impact of implementation of PPS on utilization and payments. Findings reported in the 1985 and 1986 Reports indicated a significant reduction in Blue Cross utilization and in the growth rate of payments per admission coincident with the implementation of PPS (USDHHS, 1987; USDHHS, 1989; Guterman et al., 1988). Final results of the research with Blue Cross data support these earlier preliminary findings.

An econometric model was estimated using data on 61 of 62 U.S. Blue Cross plans for 1980 through 1986, or on subsets of the information to allow

for missing data. (The 1986 Report presented Blue Cross and Blue Shield results based on 1981-1985 data.) The study estimated the impact of Blue Cross cost containment measures and of the phase-in of PPS, as well as of various control variables, on utilization, payments, and aggregate measures. This section reports the results for the aggregate variables: admissions, inpatient days, outpatient visits, inpatient payments, outpatient payments, and total payments, all measured per thousand members, as well as hospital average length of stay. The research found a negative and statistically significant effect of PPS on the admissions, patient days, inpatient payments, and total payments per thousand members measures. It found a positive and significant effect on average length of stay, which the researchers speculated might indicate a more severely ill Blue Cross inpatient population.

These results are confounded by the inclusion in the model of a dummy variable for waiver State status, indicating exclusion from PPS payment and, generally, inclusion in all-payer regulation in recent years. The coefficient of this dummy variable was consistently significant, negative, and larger in magnitude than the coefficient of the PPS measure. This indicates that both PPS and waiver State status—that is, exclusion from PPS after its implementation—reduced utilization and payments relative to levels on non waiver States before PPS. The Blue Cross and Blue Shield Association researchers report simulations of the growth of the aggregate variables over time for the entire country. These results support the initial interpretation of the PPS variable coefficients, indicating lower growth rates with PPS in comparison to a simulation in which it is assumed that no Medicare patients are covered by PPS.

The analysis of the effects of cost containment measures produced some strong results as well as numerous statistically insignificant effects. For example, adoption of prospective payment reduces inpatient and total payments per thousand members but utilization review measures have weak or insignificant effects.

The Blue Cross results on the effect of PPS are notable since they deal with payment for the under-65 population. Effects of PPS on other payers must be due to either payer or provider behavior change. These effects were discussed in the 1986 Report. Since the Blue Cross research explicitly controls for payer cost containment initiatives, it strongly suggests that PPS effects on the under-65 population proceed through provider behavior change.

Managed Care and Commercial Insurance: HMOs, PPOs, and Managed Fee-For-Service

In 1987, 16 percent of the population with employer-sponsored group health insurance belonged to HMOs and 11 percent were enrolled in PPOs. In addition to those in HMOs and PPOs, 32 percent of enrollees with employer-sponsored insurance were covered by conventional plans with strong utilization and cost management elements—managed fee-for-service (Gabel et al., 1988). This form of coverage typically involves preadmission certification and often other forms of review. By contrast, in 1981 PPOs did not exist and a BLS survey found that 4 percent of enrollees belonged to HMOs in mid-sized and large firms (the ones most likely to offer an HMO option). Even in 1984 less than 5 percent of enrollees in conventional insurance plans offered by commercial insurers had any form of

utilization review, a number that had increased to 20 percent by 1986 (Gabel et al., 1987; Gabel et al., 1988; Jensen and Gabel, 1988). Although a significant part of the increase in managed fee-for-service is attributable to the changes in Blue Cross plans discussed in the previous section, similar trends have been present among commercial insurers as well.

Managed fee-for-service represents a significant change in conventional insurance markets. It represents a competitive response to the growth of self-insurance and to HMOs and PPOs. Although the mere presence of review mechanisms does not guarantee successful control, the pattern of pre-admission certification and other measures suggests that payers are making real efforts to manage hospital use and costs. There is no evidence to directly attribute the growth of these managed care alternatives for the under-65 population to the introduction of PPS.

Self-Insurance

Expansion of corporate self-insurance is a major change in the group health insurance market. In 1987, a survey of employers designed to provide a representative sample of the U.S. population covered by employer-sponsored health insurance showed a significant increase in the proportion of organizations that self-insured since 1984. The study estimated that in 1987 60 percent of persons with conventional employer-provided coverage belonged to plans with some element of self-insurance. By contrast, in 1975 only 5 percent of employees were in self-insured plans (Gabel et al., 1988). Analysis of BLS data shows that the proportion of employees of mid-sized and large firms covered by self-insurance increased from 21 percent in 1981 to 42 percent in 1985, with almost half the increase occurring in 1984 (Jensen and Gabel, 1988).

Firms adopting self-insurance generally are replacing conventional coverage from commercial insurance companies, thus increasing competitive pressures on these insurers. However, there is no evidence that the expansion of self-insurance is directly attributable to PPS. As indicated in the 1986 Report, its growth began before the implementation of PPS. Its expansion is most likely attributable to changes in the regulation of insurance markets and to the increased cost of purchased insurance (USDHHS, 1989).

Conclusions

There have been substantial changes in health insurance and health services markets since the early 1980s and especially since the introduction of PPS. These changes have continued in 1987. It is instructive to contrast health care financing today with the early 1980s.

Medicaid programs have moved from retrospective payment of hospitals to prospective payment. In 1980, seven States had prospective systems covering 16 percent of the nation's Medicaid recipients. By 1987, 40 States had prospective systems covering 91 percent of recipients. Of these 40 States, 14 operated DRG-based systems covering 31 percent of recipients. All but one of these DRG-based systems had been enacted since 1983 and three had been adopted since 1986. The movement to prospective Medicaid payment, the adoption of DRG-based models, and many structural details of the systems are clearly attributable to the introduction of Medicare PPS.

Blue Cross plans have changed since 1980. There has been widespread adoption of cost containment measures, increased involvement in HMO and PPO

development, and increased use of prospective hospital payment. Data on the primary method by which Blue Cross plans calculate hospital payment indicate that 31 of 61 reporting plans used some form of prospective payment as the primary method of payment in 1980 and 48 did so in 1986. Although the econometric results are uncertain, the implementation of PPS appears to significantly affect utilization by and payments for Blue Cross patients under 65 years of age, even after controlling for the independent effects of Blue Cross cost containment measures.

With the exception of Medicaid and Blue Cross, there is no evidence that PPS had clear effects on other payers for health care such as commercial insurers or managed care plans. The period since 1980, and especially since 1983, has been one of major changes in markets for health insurance. Enrollment in managed care systems such as HMOs and PPOs has increased from no more than 4 percent in 1981 to 27 percent of those covered by employer-sponsored health insurance in 1987. Conventional health insurance (including both commercial insurers and the Blue Cross plans discussed above) now involves many cost containment features, reducing the difference between such coverage and managed care systems, such as HMOs and PPOs. In 1987, 32 percent of persons covered by employer-sponsored insurance could be considered insured by managed fee-for-service. In 1986, approximately 20 percent of enrollees in conventional plans sponsored by commercial insurers (thus excluding Blue Cross) were covered by utilization review in contrast to 1984, when fewer than 2 percent were covered. Over the 1984-1986 period, concurrent and preadmission review became much more common at Blue Cross plans as well. Although the effectiveness of these cost containment features are uncertain (and, in the case of Blue Cross, differ

by feature) their very pervasiveness suggests serious efforts to manage care. Finally, in 1987 as many as 60 percent of employees with group health insurance were covered by plans with some form of self-insurance. By contrast, in 1981 self-insured plans covered 21 percent and in 1985 42 percent of employees at mid-sized and large firms (the most likely to have self-insurance). Since the population of employees covered and the definition of self-insured status differ between the 1981-85 and the 1987 estimates, it is not possible to calculate precisely the growth of self-insurance since 1985.

These private sector changes in managed care, cost containment, and self-insurance are not clearly attributable to the introduction of PPS. However, the enactment of Medicare prospective payment "legitimized" cost containment activities by other payers and contributed to the competitive environment of the middle and late 1980s. The evidence of an independent effect of PPS on Blue Cross utilization and payment over and above the effects of plan cost containment measures also suggests the possibility that further research might identify a similar effect for other private payers.

References

- Gabay, M. and Bell, S.: Impacts of the Medicare Prospective Payment System on State Medicaid Programs. Unpublished working paper. Abt Associates, Inc. Washington, D.C. September 1988.
- Gabel, J., Jajich-Toth, C., Williams, K., Loughran, S., and Haugh, K.: "The Commercial Health Insurance Industry in Transition." Health Affairs. Vol.6 (Fall 1987), pp.46-60.
- Gabel, J., Jajich-Toth, C., deLissovoy, G., Rice, T., and Cohen, H.: "The Changing World of Group Health Insurance." Health Affairs. Vol.7 (Summer 1988), pp.48-65.
- Guterman, S., Eggers, P., Riley, G., Greene, T., and Terrell, S.: "The First 3 Years of Medicare Prospective Payment: An Overview." Health Care Financing Review. Vol.9 (Spring 1988), pp.67-77.
- Hadley, Jack, Feder, Judith, and Zuckerman, Stephen: Changes in Hospitals' Revenues From Privately Insured Patients During PPS or, Hospital Cost Shifting Revisited. Unpublished working paper. N.p. December 1988.
- Jensen, G. and Gabel, J.: "The Erosion of Purchased Health Insurance." Inquiry. Vol.25 (Fall 1988), pp.328-343.
- Kenkel, P.: "Losses Send Blues Scrambling." Modern Healthcare. Vol.18, July 1, 1988, pp.14-19.
- Mullen, Patrick: "Big Increase in Health Premiums." HealthWeek. Vol. 2, December 26, 1988, pp.1-26.
- Scheffler, R., Gibbs, J., and Gurnick, D.: The Impact of Medicare's Prospective Payment System and Private Sector Initiatives: Blue Cross Experience, 1980-1986. Final Report. Blue Cross and Blue Shield Association and University of California, Berkeley. N.p. July 1988.
- Short, P.: "Trends in Employee Health Benefits." Health Affairs. Vol.7 (Summer 1988), pp.186-196.
- Short, P., Monheit, A., and Beauregard, K.: Uninsured Americans: A 1987 Profile. National Medical Expenditure Survey. National Center for Health Services Research and Technology Assessment. Rockville, MD. 1988.
- Singer, J., Karon, S., Pendleton, S., and Bachman, S.: The Effects of Medicare PPS on Medicaid Programs. Unpublished working paper. Brandeis Health Policy Research Consortium. Waltham, Mass. December 1986.

References (Con't.)

- U.S. Department of Health and Human Services: The Impact of the Medicare Hospital Prospective Payment System, 1985 Annual Report. Report to Congress. HCFA Pub. No. 03251. Washington, D.C. August 1987.
- U.S. Department of Health and Human Services: The Impact of the Medicare Hospital Prospective Payment System, 1986 Annual Report. Report to Congress. 1989.
- Zuckerman, Stephen: "Medicaid Hospital Spending: Effects of Reimbursement and Utilization Control Policies." Health Care Financing Review. Vol. 9 (Winter 1987), pp.65-77.
- Zuckerman, Stephen, and Holahan, John: "PPS Waivers: Implications for Medicare, Medicaid, and Commercial Insurers." Journal of Health Politics, Policy and Law. Vol. 13 (Winter 1988), pp.663-681.

Table 5.1

**PERSONAL EXPENDITURES FOR
HOSPITAL CARE
BY SOURCE OF FUNDS,
1984-1987**

	1984		1985		1986		1987		Expenditure Growth (Percent)		
	Amount	Share	Amount	Share	Amount	Share	Amount	Share	1984-85	1985-86	1986-87
Hospital care	156.1	100.0	166.7	100.0	178.4	100.0	194.7	100.0	6.8	7.0	9.1
Direct payments	14.1	9.0	15.4	9.2	16.7	9.4	18.5	9.5	9.3	8.5	10.9
Third party payments	142.0	91.0	151.4	90.8	161.7	90.6	176.2	90.5	6.6	6.9	9.0
Private	72.3	46.3	76.3	45.7	83.1	46.6	92.6	47.5	5.5	8.9	11.4
Private insurance	56.5	36.2	58.9	35.3	64.4	36.1	71.9	36.9	4.1	9.6	11.6
Other private	1.7	1.1	2.0	1.2	2.0	1.1	2.2	1.1	20.9	-1.8	9.3
Government	83.9	53.7	90.5	54.3	95.4	53.4	102.2	52.5	7.9	5.6	7.1
Federal	66.0	42.3	71.3	42.7	75.1	42.1	80.0	41.1	8.0	5.4	6.4
Medicare	44.5	28.5	48.2	28.9	50.6	28.2	53.3	27.4	8.4	4.5	5.8
Other	14.2	9.1	14.9	8.9	15.9	8.9	17.0	8.7	5.2	6.8	6.8
State and local	17.9	11.4	19.2	11.5	20.2	11.3	22.2	11.4	7.6	5.3	9.7
Medicaid (total)	13.9	8.9	14.9	9.0	15.8	8.9	17.8	9.1	7.8	5.9	12.2
Other	11.3	7.3	12.5	7.5	13.2	7.4	14.1	7.3	9.7	6.3	6.8

Note: Private payment total includes direct payments. Federal payment

----- total includes Federal share of Medicaid. Medicaid (total) includes both Federal and State shares.

Expenditure amounts are in billions of dollars.

Expenditure shares are in percent.

Source: Health Care Financing Administration, Office of the Actuary



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